URBAN COMFORT:

Adaptive capacity in post-earthquake Christchurch

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by

Silvia Garcia Tavares

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The urban environment influences the way people live and shape their everyday lives, and microclimate sensitive design can enhance the use of urban streets and public spaces. Innovative approaches to urban microclimate design will become more important as the world's population becomes ever more urban, and climate change generates more variability and extremes in urban microclimatic conditions. However, established methods of investigation based upon conventions drawn from building services research and framed by physiological concepts of thermal comfort may fail to capture the social dynamics of urban activity and their interrelationship with microclimate. This research investigates the relationship between microclimate and urban culture in Christchurch, New Zealand, based upon the concept of urban comfort. Urban comfort is defined as the socio-cultural (therefore collective) adaptation to microclimate due to satisfaction with the urban environment. It involves consideration of a combination of human thermal comfort requirements and adaptive comfort circumstances, preferences and strategies. A main methodological challenge was to investigate urban comfort in a city undergoing rapid physical change following a series of major earthquakes (2010-2011), and that also has a strongly seasonal climate which accentuates microclimatic variability. The field investigation had to be suitable for rapidly changing settings as buildings were demolished and rebuilt, and be able to capture data relevant to a cycle of seasons. These local circumstances meant that Christchurch was valuable as an example of a city facing rapid and unpredictable change. An interpretive, integrative, and adaptive research strategy that combined qualitative social science methods with biophysical measures was adopted. The results are based upon participant observation, 86 in-depth interviews with Christchurch residents, and microclimate data measurements. The interviews were carried out in a variety of urban settings including established urban settings (places sustaining relatively little damage) and emerging urban settings (those requiring rebuilding) during 2011-2013. Results of this research show that urban comfort depends on adaptive strategies which in turn depend on culture. Adaptive strategies identified through the data analysis show a strong connection between natural and built landscapes,

combined with the regional outdoor culture, the Garden City identity and the connections between rural and urban landscapes. The results also highlight that thermal comfort is an important but insufficient indicator of good microclimate design, as social and cultural values are important influences on climate experience and adaptation. Interpretive research is needed to fully understand urban comfort and to provide urban microclimate design solutions to enhance the use of public open spaces in cities undergoing change.

Keywords: adaptive capacity, comfort, adaptation, culture, microclimate, urban landscapes, urban design, urbanism, earthquake, Christchurch, New Zealand

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RESEARCH OUTPUT

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Personal Website

http://silviatavares.com

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PREFACE

> [JUNE]
>
> I waited all afternoon for a wind storm coming from Porto Alegre. The night arrives. A drizzle starts to fall again over Satolep[1]. The moisture makes the floor tiles and books sweat; damages discs, softens book covers. It's June. I go to the window, clean the glass and look at the street. Regular paving stones are lit by the light of the posts where we can see at first the dense fog coming, slowly descending to the ground and transforming this planned city into an infinite one. Nothing and no one can find Satolep at night in these conditions. The wind storm will not come. I return to my desk and sit down. I stare at the photo of Edgar Allan Poe, but I cannot see it.
>
> [ANOTHER JUNE]
>
> I'm in another June. I'm in my apartment in Copacabana, Rio de Janeiro, in shorts and jandals, watching the national news on TV. I watch a story about a popular street festival in Bahia. The images: an electric trio on a truck dragging thousands of semi-naked people, jumping, sweating, drinking and singing under an angry sky. I cannot imagine myself behind that bandwagon. I cannot feel close to the spirit of that party, although I am also half-naked and hot and the news is being presented in a tone of absolute normality, as if it was part of my daily life. Following that I watch a story about the arrival of cold weather in the south. I see Rio Grande do Sul, I see the fields covered by white frost under the morning light, I see children writing on the car glasses with their fingers, I see men in their ponchos riding bikes, I see frozen water, I see people rubbing their hands, people with red noses, I see the expectation of snow on the mountains, I see the drink fuming. Half-naked and hot I immediately recognize that as my universe. But the images are presented in a tone of abnormality, of curiosity, almost incredulity, as if coming from another country, there is talk about an 'European feel' – which makes me feel strangely isolated, more than physically apart. I have the uncomfortable feeling of being in exile and at the same time see Rio Grande do Sul near, within and beyond the images. I realise then how much I feel separated from Brazil. (…) (Ramil, 2004)

Before living in New Zealand I had the opportunity of living in two different regions of my own continental-sized country, Brazil. Porto Alegre is the capital of Rio Grande do Sul, the most southern state of Brazil, where Pelotas – or Satolep in the citation above – is located. The state has a subtropical climate with well-defined seasons. By well-defined seasons I mean a cold one and a hot one. It was not until I moved to New Zealand that I realised that 'well-defined' seasons could have different meanings, especially in the South Island, where the colour of the trees define autumn and where I have heard a local saying that if there is no snow on the mountains, there is no winter. The second region I lived in Brazil is located in the north, in the tropics, and is land locked. The city is

[1] Anagram used by Vitor Ramil to describe an imagined city within a city. *Satolep* is the author's hometown full of memories and poetry. *Satolep* is the word *Pelotas* backwards. *Pelotas* is the real name of his – and my – hometown.

called Palmas and is located in the Tocantins state, the youngest state in Brazil. Palmas has two defined seasons: the dry and the rainy, and the temperatures are rarely below 25°C, including night time.

Palmas is a city planned following modern urbanism principles, with wide avenues and mobility based on cars. It became clear very soon to me that the urban design, the amount of asphalt, lack of intimacy, vegetation and shade were not conductive to urban life. But there was something else. There was what Ramil described above as abnormality, curiosity and almost incredulity, that we, southern people, could live well in the cold weather. Locals believed they would not support it. Going to the south for holidays I experienced the opposite. People from my hometown had terrible thoughts about living in hot weather. And it kept happening in New Zealand where I frequently see surprised faces when I talk about Palmas' climate. But I adapted, everybody did and does. However, the way we adapted in the south of Brazil is not the same way we adapt here in New Zealand. Moreover, there was something misguided with the urban microclimate in Palmas. Surely there was a different way to respond to the local climate, surely the quality of urban life could have been improved through design.

CHAPTER ONE: Introduction

The global population is now more urban than ever before. 52% of the world's population live in urban areas[2] (The World Bank, 2014a), and in New Zealand this number is even higher (86%) (The World Bank, 2014b). The shift to an increasingly urban future requires thoughtful planning and design strategies to ensure urban liveability through good urban environments and infrastructure. Climate change creates additional challenges for cities, increasing the heat island effect, and requiring new adaptive strategies.

Public open spaces are key to the success of cities and activity in these spaces is influenced by people's levels of comfort, which depends on microclimate. Although the climate cannot be changed, microclimate can be amended through design and there are many ways people can adapt to the urban thermal environments, as long as they find reasons to do so. Taken together these urban trends create a need to better understand and manage *urban comfort*. How do people adapt to microclimate in urban centres?

Much past work on urban microclimate and its role in urban sustainability has focused upon building efficiency (de Dear & Brager, 2001; Givoni et al., 2003; Ratti, Baker, & Steemers, 2005; Steemers, 2003a, 2003b, 2003c; Tavares & Silva, 2008; Tavares, Silva, & Kinsel, 2006). Other researchers have looked at improving use of public space (Lenzholzer, 2010; Thorsson, Honjo, Lindberg, Eliasson, & Lim, 2007; Zacharias, Stathopoulos, & Wu, 2001). Urban studies have shown that microclimate is important for defining what types of activities can be generated in an urban environment (Gehl, 2010; Whyte, 2001) and generic guidelines for microclimate-based design have been developed (Brown, 2010; Brown & Gillespie, 1995; Erell, Pearlmutter, & Williamson, 2011). The current approach to microclimate, however, is largely based upon the physiological and individualistic view of thermal comfort. It includes urban microclimate, but does not consider cultural influences on people's microclimate experience and strategies they use to adapt.

The relationship between climate, culture and adaptation is complex, and the outdoor thermal comfort and microclimate design literature presents limited understanding about how cultures collectively adapt to climate. Nonetheless, there is a growing need to conduct more studies based upon a bottom-up approach to urban climate *experience*, asking how the city dynamics are affected by culturally based meanings. Studies of this dimension of urban microclimate adaptation become increasingly important because of the wider urban challenges.

[2] Following The World Bank (2013) definition "urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects".

The central proposition of this research is that comfort in urban environments depends on the quality of the biophysical and social environment from the perspective of local culture. I define urban comfort as the combination between people's adaption to the climate and the existing qualities in urban spaces. Urban comfort is therefore an "achievement rather than an attribute" (Shove, 2003, p. 23), which is shaped and enabled by culture. My research focus is to understand this process and relationship, and it is undertaken in a setting that is both highly seasonal and changing rapidly, and where adaptation is a requirement rather than a choice.

This first chapter introduces the research context and questions, summarises the theoretical and methodological approach, and presents an outline of the thesis structure.

1. RESEARCH CONTEXT

The geographic focus of this research is Christchurch, a major urban area in the South Island of New Zealand. In 2010 and 2011 Christchurch experienced a series of destructive earthquakes and the impact of these events forced the city to re-plan and rebuild. In June 2013, more than three years after the first of these events, the last inaccessible part of the CBD (Central Business District) has been reopened to the public (Canterbury Earthquake Recovery Authority, 2013). While streets are cleared and prepared for rebuild, people from Christchurch have become used to living with building demolitions – which are still going on – cranes, diggers and street repairs. Many other areas of the city, such as parks, squares and hills have also been affected. Public consultation over the CBD has identified a desire for a greener environment (Christchurch City Council, 2011c), and consequently new perspectives of a sustainable city have emerged (Canterbury Earthquake Recovery Authority, 2012; Christchurch City Council, 2011a). Christchurch is therefore a city undergoing rapid urban change, with a need and desire to become more liveable. It offers a powerful and widely relevant focus for research into adaptation to microclimate, and the concept of urban comfort can contribute to promoting higher levels of satisfaction with the rebuilt urban environment, thus contributing to economic and social regeneration (Tavares, Swaffield, & Stewart, 2013b).

1.1. The earthquakes

Urban life in Christchurch started to change on 4 September 2010, when a 7.1 magnitude earthquake struck near Darfield, a town located 35km west of Christchurch. This first earthquake was followed by thousands of significant aftershocks, including the destructive 6.3 magnitude which struck on 22 February 2011 at Heathcote Valley, just 7km away from Christchurch CBD. Despite registering a lower magnitude, the February earthquake had a much more significant and irreversible impact than the September earthquake. 185 people died and thousands lost their homes. It is estimated that around 10,000 earthquake damaged homes were or will need to be demolished and 100,000 homes

were damaged. Some parts of Christchurch will possibility not be rebuilt (Fairfax, 2011b). Suburbs located in the hills were affected by rock falls and land slips (Romanos, 2011) and damage related to liquefaction occurred city wide, but more intensely in the east, while some western suburbs experienced little damage. More than half of the Christchurch's heritage buildings were located in the central city (Christchurch City Council, 2011a, p. 13) and were also extensively damaged.

Before the February 2011 earthquake the central city hosted more than 6,000 businesses, employing around 51,000 people and attracting 1.8 million visitors (Canterbury Earthquake Recovery Authority, 2012). The February 2011 earthquake forced the implementation of a *Red Zone* that excluded public access for safety reasons. This gradually shrinking area remained inaccessible until 28 June 2013, except to authorised people who were working on the area[3] (Canterbury Earthquake Recovery Authority, 2013). The businesses previously located in the central city were forced to relocate or close. The relocation of these establishments has shifted a large part of the central city activity to the undamaged suburbs, increasing their population and economic activity (Christchurch City Council, 2011a, p. 13) while raising questions about how to best regenerate the central city which has inevitably changed in character.

It was in this context of instability that I carried out this research. The ground, the soil, the climate, the weather, seasons, and the local culture all provide important context for the design and regeneration of the city. Thus, the devastating post-earthquake context is also an opportunity to present Christchurch as an example of a resilient and sustainable city. As the Canterbury Earthquake Recovery Authority (CERA) (2012, p. 1) claimed:

> The 2010 and 2011 earthquakes struck one of New Zealand's oldest cities, a community with deep ties to the land, the environment and each other.
> The devastation was widespread, especially in the city's centre.
> Some questioned whether central Christchurch could ever be the same again.
> It won't be.
> It will be even better.[4]

1.2. The urban rebuild and design challenges

Christchurch rebuild is underway while this thesis is being written. The *Christchurch Central Recovery Plan* (Canterbury Earthquake Recovery Authority, 2012) has been released and the City Council is committed to realising the collective vision of a liveable city that was expressed through over 106,000 ideas submitted in the *Share an Idea* consultation process (Christchurch City Council, 2011c).

[3] In February 2013 the 'Red Zone' was renamed to 'Rebuild Zone'.

[4] This thesis uses the APA Style Referencing. This document presents citations both incorporated in the text (shorter than 40 words) and in freestanding blocks of text (longer than 40 words) (see American Psychological Association, 2010, p. 173). There are citations from literature and citations from interviewees. Citations from literature are preceded or followed by their author(s) and date. Citations from interviewees are in italics and invariably followed by its author's code.

> (…) this Recovery Plan sets out how that vision can be achieved. The Plan defines the form of the central city, sets out the locations of key anchor projects needed to optimise recovery, and outlines block plans which show what the city could look like in the future. (Canterbury Earthquake Recovery Authority, 2012, p. 3)

Based upon the projects planned for the new central city, the main intention is to make Christchurch an international city which is green, accessible, with a compact core and a strong built identity. The new central city will preserve the memory of the past events that have re-shaped the city while providing a contemporary urban environment (Canterbury Earthquake Recovery Authority, 2012, p. v).

The Recovery Plan is based upon ten main principles: compress, contain, catalyse, support, repair, embrace the river, open space, complete, existing value, attract (see Canterbury Earthquake Recovery Authority, 2012, pp. 29-30). It presents a Blueprint Plan defining a new central city core, which will redefine the CBD area. The compression of the area is aimed at constraining development and providing more concentrated vibrancy in the urban environment. This development is based upon the *frame* and *precincts* which will be promoted through anchor projects (Canterbury Earthquake Recovery Authority, 2012). Another main objective of the Recovery Plan is to enhance accessibility. Mobility will be mainly focused on pedestrians within the core and car parking will be available within easy walking distance. Residents and visitors will be able to choose whether to travel into and about the city by public transport, cycle or car.

There is a clear intention of building on the Garden City identity and supporting the use of green technologies in buildings. "Housing will be linked to large-scale, beautifully landscaped public open space and greater access will be provided to the Ōtākaro/ Avon River" (Canterbury Earthquake Recovery Authority, 2012, p. 76), and it is expected that more people will live in the central city. Pocket parks, community gardens, family-friendly parks, eco-streets are also options for new designed green areas. Despite having all these plans in place, the City Council still faces difficult challenges as "endless plans, designs, concepts and discussions have so far produced little and the pace of the rebuild seems to have slumped in the first quarter of this year" (Fairfax, 2014). Furthermore, microclimate seems to be an afterthought, despite being highlighted by a number of locals in the *Share an Idea* exercise (Christchurch City Council, 2011c). Some highlighted the impact of microclimate on their experience: *"in winter the square is desolate and uninviting. It needs wind-breaks, people, movement, activity, day and night to enliven the central city"* (Donald); and others asked for attention: *"create shelter with covered walkways within the 4 aves [sic] and pay attention to our crazy weather & wind patterns, also use trees for shade"* (Justine, Halswell).

The rebuild of central Christchurch needs every help it can get. If the rebuilt central city is to attract people, then landscape architects and urban designers must consider how to make the streets and

spaces not only ‘pedestrian-friendly’ but also ‘microclimate-friendly’ (Tavares, 2014). The planning of spaces to make attractive public streets and spaces in a city where there can be four seasons in one day has to consider the design of microclimate. One of the most striking aspects of the transitional stage of the recovery has been the success of the Re:START project in drawing people into the post-earthquake environment where open, sunny and sheltered spaces have attracted people even in the midst of demolition. Will there be equally sheltered, sunny and colourful courtyards in the new precincts and private developments? Have the designers and developers maximised on sun and shade and shelter? Can an understanding of urban comfort help shape a liveable new city?

2. RESEARCH QUESTIONS

The main aim of this research is to understand how public spaces within the city of Christchurch are used and how local people adapt to specific microclimatic conditions. Hence, Christchurch’s culture and its relationship with climate are central concepts in the research which is guided by four main questions:

Q1: What are the characteristics of urban comfort in Christchurch?

This first question is aimed at identifying what are the elements that generate urban comfort in Christchurch, based upon how locals live. It is focused on what people look for when choosing to be in places, and how they describe these choices.

Q2: How is urban comfort shaped through local culture in Christchurch?

The second question extends the understanding of the first one. It explores the relationship between the key characteristics of urban comfort in Christchurch and its regional identity and assumes that response and adaptation to the local climate is dependent on regional identity and culture (Hough, 1990; Paasi, 2003).

Q3: What individual and social strategies people use to adapt to a highly variable (micro)climate?

The third question is based upon the claim that the temperature variability of temperate climates require a wide range of adaptive strategies, which besides being influenced by culture, can vary from individual to social strategies. Most research in urban climate have focused on hot climates (Gupta, 1984; Jitkhajornwanich, 2006; Johansson, 2006; Shashua-Bar, Pearlmutter, & Erell, 2009). This research turns, instead, to the question of adaptation in a highly seasonal climate.

Q4: What methodological approach is needed to explore urban comfort?

The fourth question explores the methodological consequences of investigating urban comfort as a socio-cultural achievement. Due to the culturally-based variables involved, conventional methods focused on measuring individual perceptions and preferences are insufficient. Thus, in this research I adopt an integrative approach that combines ethnographic investigation with more technical measures to human comfort in urban landscapes. I decided that this approach was best suited to my research objectives because of its exploratory nature, asking *why* people adapt to the climate in certain ways. This decision influenced my choice of methods.

I address these interconnected research questions through an investigation of post-earthquake Christchurch, from the perspective of local urban comfort and ways of enhancing it through urban landscape design. My approach to the investigation shifts the perspective of human comfort in urban environments from an individual perspective of thermal comfort to a collective one, considering the cultural values and reasons for adaptation. I propose a methodology for investigating and interpreting cultural and biophysical dimensions of urban comfort. I use a multi-method approach based upon predominantly qualitative methods of inquiry supported by local microclimate measurements. This approach provides a means of understanding how the climate adaptation is shaped through culture, rather than attempting to measuring quantifiable attributes of human comfort.

My working proposition is that an integrated approach to urban microclimate and its environment can result in an extended use of public open spaces due to greater satisfaction with the urban environment. It is hoped that the outcomes of this research will help clarify the role of urban landscape design towards urban liveability and adaptation to the weather and climate.

3. THEORETICAL APPROACH

Given my background in Building Science, I was already familiar with studies that focus on the technical evaluations of the built environment, including thermal comfort. However, particularly when applied to urban environments, these numerical evaluations lacked the human-based dimensions of city life. All the cultural and environmental elements found in cities clearly enable people to adapt in particular ways, following local socio-cultural values and norms. These dimensions of *urban comfort* made my attention shift to studies in the social sciences. Work in the sociology of comfort has argued that it is necessary to explore the cultural relationship between people and the environments they inhabit (Shove, Chappells, Lutzenhiser, & Hackett, 2008), highlighting that meanings of comfort are neither singular nor definitive, but instead highly flexible socio-cultural constructs.

This socio-cultural perspective also means that if we wish to understand people's response to microclimate then it is necessary to understand the collective experience of users of public open space (E. Wilson, Nicol, Nanayakkara, & Ueberjahn-Tritta, 2007)[5], so these spaces can be designed and managed to provide liveability. The key relationship of interest here is between adaption to outdoor environments, in particular their microclimate, and satisfaction with the urban environment regarding the types of space and urbanity they offer (Blotevogel, Danielzyk, & Hohn, 2008; Gehl, 2010; Hebbert, 2005; Lees, 2010; Montgomery, 1998; Stevens, 2007; Whyte, 2001, 2009). As a consequence, the research draws mainly upon disciplines of cultural geography, sociology, anthropology, urban studies, urban microclimate and human thermal comfort, and is centred on the concept of *urban comfort*, which combines thermal comfort and preferences for urban landscape, and their relationship to cultural values.

4. THESIS OUTLINE

Chapter Two explains the background of the research and the theoretical framework centred on the concept of *urban comfort*. The chapter explores topics relevant to the shaping of urban comfort from a cultural and collective perspective.

Chapter Three sets out in detail the research strategy based upon an interpretive, integrative and adaptive approach. It also presents the multi-method case study which is explored through ethnographic methods and microclimatic data collection. The chapter concludes with a reflection about the challenges and limitations of the method and the ethical concerns involved in this research.

Chapter Four is aimed at providing information about the case study. It introduces the context – Christchurch – based upon its geography, climate, culture and lifestyle. It presents the four case study sites within Christchurch, why they were chosen, and a short contextual history of their locations.

Chapter Five presents the key findings based upon the sites themselves. It explores the dynamics of the four case study sites based upon their nature as *urban social spaces* or *urban retreat spaces*, their microclimate and urban environment.

Chapter Six is focused on understanding locals' general experience of the local climate, choices for places in the city, and the relationships between experiences and the microclimate. Strategies used to adapt to microclimate – both in the individual and collective levels – are discussed.

[5] The APA Style requires that a document citing publications by two or more primary authors with the same surname must include the first author's initials in all text citations, even if the year of publication differs (see American Psychological Association, 2010, p. 182).

In **Chapter Seven** I present the local urban lifestyle deriving from factors related to the physical and social landscape realms. This chapter provides evidence from interviews related to the local cultural background and characteristics that are relevant to the construction of urban comfort in Christchurch.

Chapter Eight summarises how urban comfort is shaped in Christchurch's current context. It also describes the significance of key findings, and implications of my research for theory, methodology and practice in urban landscape design, particularly design concerned with providing urban comfort. Finally, I suggest opportunities for future research related to urban comfort in areas such as climate change, post-disaster settings and health.

CHAPTER TWO: Theoretical framework

1. INTRODUCTION

In this chapter theoretical concepts that are relevant to understanding how *urban comfort* can be achieved by people using urban open spaces are examined. In addition theories related to urbanity, local cultures, urban microclimate and thermal comfort, and adaptive capacity are reviewed.

Knowledge about thermal comfort has been developed over the past 50 years predominantly from an indoors and individual perspective. Urban microclimate has also been studied both from a microclimate design perspective and to provide thermal comfort to users of public open spaces. The first aims to find design solutions that create improved microclimate. The latter assesses human thermal comfort considering physiological, psychological and behavioural variables. The idea of thermal comfort, however, has been challenged, especially regarding variables that have been over time assumed as 'normal' (Chappells & Shove, 2005; Cole, Robinson, Brown, & O'Shea, 2008; Shove et al., 2008; Strengers, 2008). These researchers argue that not much attention has been paid to the users of spaces and that standardised set of conditions implicit in technical definitions of thermal comfort conflict with results achieved in field studies. Shove (2003) proposes an 'adaptive approach' to comfort, and supports the idea that it should be defined as an achievement rather than an attribute.

My research is based upon the premise that local culture and collective identity are vital factors in defining people's response to urban microclimate, and hence the way they use and adapt to a changing urban environment. I argue that *collective* values and usage of the physical and social landscape are critical variables in the definition of comfort in urban environments. The research extends the examination of microclimate design to consider *urban comfort* – a combination of human thermal comfort and place-related meanings, including cultural adaptation to microclimate (Tavares, Swaffield, & Stewart, 2013a; Tavares et al., 2013b). This chapter reviews topics that are relevant to this wider conception of urban comfort understood from a cultural and collective perspective. The chapter is structured in five main parts: local concepts of urbanity, which considers qualities and characteristics of urban living and the urban environment; local cultures and what makes places and their people unique; urban (micro)climate theories and models; the evolution of studies regarding human thermal comfort; perspectives on adaptive capacity; and a synthesis that develops the concept of urban comfort as a basis for the subsequent fieldwork.

2. LOCATING URBANITY

Globalisation of societies, economies, markets and technologies are increasing the importance of cities as centres of social life. This alone is good reason to understand the relationships and collective life of urbanites[6], as urban life is made both by its physical and its social setting. What people do collectively in the city also forms much of the urban experience for each individual living in that city (Fischer, 1984), and therefore to understand the nature of urban experience we must understand the social setting. The theories of urbanity, lifestyle, and liveability are interconnected and presented in this section from an interpretive approach considering people's urban *experience*, and consequent *adaptation* to urban spaces from a *collective* perspective.

2.1. Urbanity

The concept of urbanity is diverse, and the classical understanding of it is guided by the notion of the European city, summarised by Walter Siebel (as cited in Blotevogel et al., 2008, p. 1) as:

> The presence of history in the everyday life of city-dwellers; the city constantly perceived as a utopian promise of both economic and political emancipation; the city as the special setting for an urban life style; the image of a European townscape handed down through time; and finally, its regulatory function within the social state.

Castello's (2010, p. 21) conceptualisation of urbanity as a phenomenon that generally runs through the feeling of plurality distinctively provided by some urban spaces is important in the context of this research. He defines urbanity as:

> A typical and unique quality of the built environment, understood as that quality related to the dynamic of existential experiences acting on people when using the public urban space, through the capacity for exchange and communication implied by this space.

A similarly helpful definition is provided by Lévy (1997) who explores the manifestation of urbanity through the combination of density and diversity, or the combination of the most diverse social things in the smallest space. Lévy highlights that it is important to distinguish from relative and absolute urbanity, meaning that numbers of people are an inadequate measure and the possibility of meetings is the most important thing. The plurality mentioned by Castello is therefore the relative urbanity defined by Lévy, considering the possibility of social exchange. The critical aspect of Levy's and Castello's perspectives for my research is that the need and intensity of these social connections are factors in urban comfort, and may vary across cultures.

[6] Urbanites are conceptualized in this work simply as people living in cities.

According to these definitions, urbanity, the way the city is planned, and the affordances provided by the environment (see Gibson, 1986; Norman, 1999; Turvey, 1992) are strongly related. Urbanity has been investigated from the perspective of size of place (Tittle, 2001), lifestyle (Latham, 2003; Van Diepen & Musterd, 2009; Wirth, 1938) and from social division and political economy perspectives (Latham, 2003). In most cases, however, the physical attributes and built form tend to be dominant discussions (Castello, 2010; de Holanda, 2003; Kloosterman & Trip, 2011; Lees, 2010; Lévy, 1997; Montgomery, 1998; Rio, 1990). For this reason, Vallance and Perkins (2010, p. 4) have suggested that:

> The actual connections to urbanity require elaboration and further exploration, particularly with regards to the ways in which the city's human inhabitants (and their rights) tend to disappear in a discourse of bio-physical environmental attributes or built form.

Understanding nuances between spatial design and resulting urban life is of fundamental importance. One might think, for example, that promoting open public spaces is an ideal way of increasing urbanity, however extreme open spaces can also be unattractive. Ideally urban spaces should accommodate different groups' activities in a way that they do not inhibit one another. Stevens (2007, p. 202), exploring the potential of public spaces through play[7], states:

> Ideally, most public spaces should have more edges within them, more distinct zones and more variation in character, and more contents. Play in public focuses attention on the great variations of ways that people like to position themselves in relation to edge conditions of urban space, at many different scales, in order to regulate their exposure to other people and to other stimuli. To ensure adequate levels of stimulation, people often seek the tension of boundaries within public spaces (…). Edges and thresholds are popular sites for play precisely because of their looseness and variability of experience. They provide something to work with and work against. Public space is often too open, too even and too safe.

Stevens' argument highlights the importance of different types of public space 'zones', rather than the idea that first of all what is needed in urban spaces is vitality and many people in the same place. Activity itself certainly serves as an urban attraction and a reason for certain groups to choose certain areas. People tend to gather where things are happening and where other people are (Whyte, 2001, 2009). On choosing between walking down a deserted or a lively street, most people would choose the street with life and activity. The walk will be more interesting and feel safer (Gehl, 2010). However, for leisure time – or play – the lively or busy street might perhaps not be always the most adequate. Different groups – regarding age and lifestyle – who live in the same city could be interested in different types of urban activities.

[7] As a simplification, this concept can be understood as opposition of long-term purposes, productive work and serious consequences. Play is closely connected to leisure and fun (Stevens, 2007).

Jane Jacobs in her book *The Death and Life of Great American Cities* (1992), one of the first comprehensive criticisms of high modernism, argued that cities are made of a complex fabric of urban life that promotes urbanity. Her ideas emphasise the economic relevance of an attractive urban environment with all its features and variables, and have been further explored by other researchers (Rykwert, 2004; Sternberg, 2000). Despite the importance of the theme, there have been only a few focused empirical studies on urban public spaces which explore 'non-functional' understanding of the use and design of public space (Stevens, 2007). Whyte (2001, 2009) and Gehl (2010; Gehl & Svarre, 2013) are examples of these studies and are focused upon users' behaviour and preferences. These authors have explored the use of public open spaces from general activity perspective and have extensively investigated where people choose to spend their time in urban environments. In particular Gehl and Svarre's (2013, p. 15) analysis of the sunny and the shaded spaces is important regarding the scope of this research:

> Microclimate, the local climate of a specific site, can heavily impact whether people stay there. If people are walking from point A to point B, they can usually live with sub-optimal wind, sun or shadow conditions, but for staying activities a place needs a higher level of climate quality.

The majority of studies that take climate into account, however, are centred on the physical aspects of climate, such as airflow and wind, temperature, humidity and precipitation, heat islands and air pollution (de Holanda, 2003; del Rio, Duarte, & Rheingantz, 2002; Hough, 2002a; Woolley, 2003). Studies on less technical dimensions of the urban space – including the relationship between climate and urbanity – would be of great value, but are still rare.

> Further research is needed to explore in more detail the microgeography of urban space, the way in which built elements structure human experience and movement within the scale of the body's reach, the behavioural importance of particular properties such as slope, texture and temperature, perhaps focusing on non-instrumental behaviors. (Stevens, 2007, p. 210)

Urbanity has been discussed based upon many different meanings and, for that reason, a more precise definition is still needed (Vallance & Perkins, 2010; Van Diepen & Musterd, 2009). It is both a socio-cultural and a built environment construct. It is a lifestyle or way of living in the city, and it is a form of civic culture that requires tolerance to difference. The relationship between urbanity and liveability is also unclear. Despite the compact city being largely acknowledged as the main solution for sustainable urban environments, authors such as Neuman (2005) and Ancell and Thompson-Fawcett (2008) argued that the compact city and increased densities have not taken social dimensions of city living into account, and that there is little evidence that these solutions are socially sustainable. Along the same lines, E. K. Meyer (2008) has pointed out that it takes more than ecologically regenerative designs for culture to be sustainable, instead what is needed are designed

landscapes that stimulate people to become aware of the environment and to care enough to make changes.

The desired levels of urbanity in varied places are related to urban vitality and have not been sufficiently explored from cultural perspectives. The way people live in the city and their chosen lifestyle influences cultural expectations towards the city. These concepts are discussed next.

2.2. Urban life and lifestyle

Lifestyle can be defined in many ways and researchers frequently do not clearly define the concept. In a general sense it can be associated with a way of living – e.g. urban lifestyle, rural lifestyle, sustainable lifestyle and so forth – these ways of living can happen anywhere and are not necessarily related to the a specific place. Urban lifestyles, for example, may have different characteristics according to the place where they happen and its regional identity. Lifestyle can be defined as daily life routines, for example as observed in urban areas (Van Diepen & Musterd, 2009) and can be associated with analyses of urbanity (Latham, 2003; Wirth, 1938) to understand how they interact and shape each other. In this sense lifestyle is a set of activities that generate the dynamics and character of cities regarding use of urban spaces. It is built on daily routines and values as a consequence of cultural and collective meanings. Therefore, the preferences of people from different places may vary, and the understanding of local lifestyles and preference for urban life is crucial for planning and providing urbanity and liveability. Urban lifestyle in this research is conceptualised as a collective understanding of city living, based upon urban daily routines and its relationship with the local culture and climate.

These relationships are fundamental for providing liveability, which implies people's satisfaction with what the city has to offer. Apart from basic needs, this satisfaction is also closely related to cultural values. In the next section the concept of liveability adopted in this research is discussed and its connection to current concerns related to microclimate, which highlights the importance of understanding local meanings of comfort.

2.3. Liveability

Liveability is a fundamental element to the prosperity and development of cities. It is related to the qualities of urban environments that make them attractive places to live (Leby & Hashim, 2010). The deeper meanings of liveability, however, are more ambiguous. Heylen (2006) has suggested that there has been no agreement in the literature regarding what is involved in the concept of liveability. According to Wheeler (2001) to be liveable a city has to be pleasant, safe, affordable, and supportive of human community, and Kunzmann (2010) added some ways to support the liveability of a town:

beauty, the cultural heritage, local architectural traditions, attractive public parks, individual security and leisure opportunities.

Liveliness and vitality are commonly seen as related to the "occurrences of people and businesses in a central district as a pull factor to the city and as a means to prevent urban decay" (Van Diepen & Musterd, 2009, p. 2). Timmer and Seymoar (2006, p. 2), have defined liveability as "quality of life as experienced by the residents within a city or region". The quality of the built and natural environment are reasons for people to stay in a city (Kunzmann, 2010) and liveability results from the interaction between community and environment (Shafer et al., 2000).

Hebbert and Webb (2012) have considered how urban form impacts on microclimate and its potential of enhancing or reducing the quality of urban life. Their work draws upon the experience of Sttutgart, a city that deliberately studied the behaviour of its local weather systems and learned how to manage them through physical planning. Their conclusion highlights the importance of understanding microclimate for the liveability of cities, even when considering larger scale issues of climate change:

> (…) It shows that climate-awareness is not just about GHG emissions and their disastrous consequences for the stratosphere. The scale of anthropogenic climate change which most affects liveability is closer to hand within the physical configuration of the built-up urban landscape that is to say, the realm of city planning. (Hebbert & Webb, 2012, p. 16)

In this work, I seek to understand local lifestyles in Christchurch in relation to the outdoor culture and the socio-cultural value of the landscape. The objective is to explore local lifestyles and liveability concepts to understand the desired urbanity with regard to the way locals experience and adapt to the urban microclimate. This is intended to provide the basis for the development of both a liveable city and a more sustainable urban environment.

3. CULTURE IN PLACE

Culture is at times seen as a word that does not need a definition, because of its common usage. At other times it is referred to as something impossible to define because of its intrinsic ambiguous meaning, being at times considered one of the two or three most complicated words in the English language (R. Williams, 2008, p. 16).

The concept of *culture* tends to refer to broad characterization of some aspect of the way people live(Baldwin, Faulkner, & Hecht, 2006). In sociology it focuses on repeated patterns, learned behaviours, and ways of life. Similarly, in anthropology culture is seen as distinctive patterns of thought, action and values, stressing a non-genetic character related to those things that people

create, develop or inherit from past generations (Norton, 2000). Therefore, as in archaeology, the reference to *culture* or *a culture* in anthropology is primarily related to *material* production (Geertz, 1973). In history and cultural studies, the term culture aims at signifying or attributing symbolic meanings (Baldwin et al., 2006); and in cultural geography, it is defined as the agent, while the medium is the natural area, and the result is the cultural landscape (Sauer, 1969). Concepts of culture are complex and at times overlapping, but potentially carrying different meanings. These differences – which can vary from discourse and practice to product and representation, or from ongoing action to a framework of explanation – conceal the central question of the relations between *material* and *symbolic* production (R. Williams, 2008).

Faulkner et al (2006) identified seven different themes defining culture, regardless of the discipline where the studies are situated: *structure/pattern* – a system or framework of elements (e.g., ideas, behaviour, symbols, and so forth); *function* – see culture as a tool for achieving some end; *process*: definitions that focus on the ongoing social construction of culture; *product* – related to artefacts (with or without deliberate symbolic intent); *refinement*: when culture is framed as a sense of individual or group cultivation to higher intellect or morality; *power or ideology* - focus on group-based power; *group-membership* – speak of culture in terms of a place or group of people, or that focus on belonging to such a place or group. These themes emphasise the multi-scale character of the concept of culture, which can vary, for example, from a country scale (*power or ideology*) to a local *group-membership* (local community).

The definition of culture adopted in this research follows the cultural geography concept described by Sewell (2008, p. 47) as *cultures as distinct worlds of meaning*. This perspective differs from definitions of culture as *category of social life* (regarding learned behaviours, meanings resulting from social formations, culture as a system of symbols, and so forth), or *systems of practice.* Instead, Sewell points out that defining culture as *distinct worlds of meaning* is different from the classic ethnographies which assume that cultures are highly integrated, consensual, and extremely resistant to change and clearly bounded. In contrast, this idea accepts that cultures can be contradicted, loosely integrated, are frequently contested, are subject to constant change, and are weakly bounded. However, as distinct worlds of meaning, it retains some important ideas:

> (…) A sense of the particular shapes and consistencies of worlds of meaning in different places and times and a sense that in spite of conflicts and resistance, these worlds of meaning somehow hang together. (…) [This way] Our job as cultural analysts is to discern what the shapes and consistencies of local meaning actually are and to determine how, why, and to what extent they hang together. (Sewell, 2008, p. 49)

In this sense Sewell's idea that culture can be diverse but somehow still shared in a certain place and time is related both to *structure/patterns* (cognitive structure, structure of behaviour and structure of signification) and *group membership* (belonging to a country and/or social groups in pluralistic societies) (see Faulkner et al., 2006, p. 30). The view of culture as distinctive worlds of meaning, considering structures/patterns of life and group membership is very useful in the context of New Zealand as a bicultural nation. Understanding the dichotomy of Maori and Pakeha[8] ways of living and how these groups coexist is fundamental to design public open spaces that provide urban comfort for all peoples (Falconer, 2015).

The diversity of place experience is also reflected on the experience of weather and the fact that the way "people from different societies talk about the weather varies across cultures and through time" (Strauss, 2004, p. 40). In this research when I refer to the shared *meaning of comfort* I am referring to the *idea of comfort* resulting from experience in a particular place – regarding physical (the location and locale) and social landscape (cultural response to climate) – regarding background and time of the year. In this context collective memory refers to a shared background and how it influences cultural values (Fine & Beim, 2007). The *meaning of comfort* is therefore a consequence of the collective memory and dependent on culture, as W. B. Meyer (2000, p. 23) who has studied the relationship between Americans and their weather commented:

> To say that the weather only matters because of how societies organize their lives is far from saying that it necessarily matters little. They are the reasons why it can matter tremendously. It is equally far from saying that dealing with the problems that weather does pose in any given situation is a simple matter because solving the problem requires only a change in human wants or activities. Such things are not easily changed, and any different way of life will likely only mean different, not fewer, weather problems. (…)

Climate information is filtered and absorbed depending on people's experience and consequent assumptions and attitudes (Magistro & Roncoli, 2001). Therefore, the exploration of cultural meanings that underlies understandings of climate is necessary for the application of climate studies (Roncoli, 2006). Following this need Crate (2011) has recently proposed what she calls *climate ethnography*, arguing that "the critical piece of this phenomenon for anthropology is that, in addition to the physical transformations of the earth's environment, contemporary global climate change has cultural implications" (p. 4). The changes in climate patterns will affect culture, moreover the adaptation to the new scenarios depends on culture, therefore the need to understand climate response according to cultural contexts.

[8] *Pakeha–Maori* was the 19th-century term for Europeans who chose to live among Maori as part of the tribe. Before 1840 *Pakeha–Maori* were the earliest European explorers and settlers in many parts of New Zealand (Derby, 2012). Nowadays the term *pakeha* designates European descendants.

Fieldwork has also added value through the development of cultural models of local communities regarding climate change. This has helped to fill the gaps found in scientific knowledge (Crate, 2008). Cruikshank (2005, p. 6), for instance found out that "global climate change is giving glaciers new meaning for many people who may previously have considered them eternally frozen, safely distant, and largely inert". This example highlights the effect of climate change on the relationship people have with climate itself and places.

The understanding of this relationship between culture, climate and place requires an exploration of regional identity, place experience, symbolic landscape and interaction, and seasonality. The next sections discuss these concepts.

3.1. Regional identity

The experiences that add meaning to place are dependent on regional identity, and when shared by a community become part of the local culture.

The term *regional identity* relates to the uniqueness of specific geographical regions and to the identification of people with them (Paasi, 2012). Regional identity often connotes natural or cultural dimensions such as landscapes, seasonality, language, food and so forth, which are seen both as determinants and expressions of identity (Laurie & Marvin, 1999; Paasi, 2012; Stobbelaar, Hendriks, & Stortelder, 2004). While lifestyle can be generic – such as urban lifestyle, outdoor lifestyle or sustainable lifestyle – regional identity refers to aspects of living that are dependent and strongly connected to the geographical characteristics of a certain place. Nonetheless, lifestyle and identity are related and influence each other. It is possible to find an outdoor lifestyle in many countries. In some places however, this will be the life of only some individuals, not configuring a regional identity, whereas in other regions this could be the core of the local culture. These values are attached to symbolic landscapes – which are intrinsic of a place – and the ways social life happens in that place regarding both symbolic interaction and developed collective values (see Section 3.4).

The planning of spaces to make attractive public streets has to cater for different age groups and lifestyles, including the bicultural nature of New Zealand's society, which is frequently and insufficiently acknowledged in design and public artworks. While the public artworks and design works serve as devices to connect New Zealanders with Maori culture in the form of associations with myth or traditional architectures, they often fail to connect with the social and economic realities of the places they adorn. Aesthetic or representational solutions, be they tukutuku paving patterns or the planting of native plant species, can only go so far in dealing with the core issues of multiple ethnicities working and living close together. (Falconer, 2015)

Regional identity is therefore interactive with culture. “It is what a place has when it somehow belongs to its location and nowhere else” (Hough, 1990, p. 180). It is also reliant on place specific characteristics that generate the local physical and social environment (Hough, 2002b). Cosgrove (1984) suggests that landscape is an ideological concept. “Landscape is not merely the world as we see it, it is a construction, a composition of that world. Landscape is a way of seeing the world” (p. 13). This way of ‘seeing the world’ is dependent on both experiences and ideas of how the physical landscape influences the social landscape:

> It represents a way in which certain classes of people have signified themselves and their world through their imagined relationship with nature, and through which they have underlined and communicated their own social role and that of others with respect to external nature. (Cosgrove, 1984, p. 15)

The regional experiences we have had and the habits we have developed are therefore a result of the affordances of both natural and social landscapes. Affordances are relationships that exist naturally and do not have to be known or desirable (Gibson, 1986; Norman, 1999). Man has changed the shapes and substances of his environment to change what it affords him, and the creation of urban spaces, or the built environment, are examples of that. Recently the idea of affordances of the built environment has also been investigated regarding aesthetics (Xenakis & Arnellos, 2013) in the sense that interaction aesthetics is an important factor in noticing the possibilities for action. Physical and social landscapes acquire symbolic meaning through interaction and are actors in the formation of local cultures. In effect, regional identity is the collective reaction of people to the environment over time (Hough, 2002b).

Fine (2007, p. ix) has explored how the weather and climate shapes lives and how it consequently influences regional identity:

> (…) Weather as a human concern goes beyond mere talk; it affects how we feel and how we live. Weather shapes our behaviors, determines the material conditions of our lives (our clothing, housing, and health), and channels our emotional well-being. As weather becomes climate — long-term atmospheric patterns — our sense of self, occupational order, and even our social structure are molded. National or regional character is sometimes attributed to the climatic conditions of society, as in alleged differences in character between Nordic and Mediterranean peoples, ice people and sun people.

The relationship between people and climate has recently gained greater attention due to the challenges related to global warming and climate change. The notion that climate can also be ‘imagined’ and enriched with meaning through cultural activity has also been expressed by authors such as Cruikshank (2005), Golinksi (2010), Meyer (2000) and Strauss and Orlove (2004b). Strauss and Orlove (2004a) have therefore pointed out the importance of regional identity for climate

adaptation, highlighting that the way we experience weather and climate is dependent on our culture, and adaptive initiatives regarding climate change must take the cultural dimension into account.

Studies exploring these matters have emerged in areas such as anthropology (Crate, 2008, 2011; Lahsen, 2007; Magistro & Roncoli, 2001; Rayner, 2004; Roncoli, 2006; Roncoli, Crane, & Orlove, 2009; Strauss & Orlove, 2004a), sociology (Chappells & Shove, 2005; Shove et al., 2008) and psychology (Knez, 2003a, 2003b, 2005; Knez & Thorsson, 2008; Knez, Thorsson, Eliasson, & Lindberg, 2009). Anthropologists have had a special contribution to climate research especially regarding the description and analysis of layers of cultural meaning and social practice (Roncoli et al., 2009). It has been noted that "by emphasizing collective experience and cultural framing anthropology gives voice to folk narratives of climate change, expanding the discussion beyond the broader spheres of earth sciences, policy debates, and media headlines" (Roncoli et al., 2009, p. 4). Crate (2008) for instance has recognised that research on climate change has not addressed global climate change's cultural implications, and has pointed out the need to develop research projects focusing on the cognitive and perceptual orientations of communities. The same argument has been raised by geographers such as Hulme (2008, p. 2) who draw attention to the fact that since the 1980's climate change policy and public discourse has been based upon the natural sciences, where:

> Climate is defined in purely physical terms, constructed from meteorological observations, predicted inside the software of Earth system science models and governed (or not) through multi-lateral agreements and institutions (…) a quantity wholly disembodied from its multiple and contradictory cultural meanings.

Hulme (2008, p. 3) argues that this perspective is insufficient and that "registers of climate can be read in memory, behaviour, text and identity as much as they can be measured through meteorology". Interpreting the physical dimensions of climate based upon their cultural meanings can make feasible the full understanding of climate change impacts as it "will redefine the relationships people have with place" (Fresque-Baxter & Armitage, 2012, p. 11).

Climate change will disrupt a wide range of phenomena that people value, such as ecosystem services, species, economic sectors, landscapes, human health and conceptions of place (Adger, Barnett, Chapin III, & Ellemor, 2011; Hess, Malilay, & Parkinson, 2008). In this sense, Gorman-Murray (2010, p. 2) has argued for "the need to appreciate localised interpretations of climate change through cultural meanings", and while my primary focus is urban design rather than climate change adaptation, my research sits at this interface of climate and cultural meanings.

3.2. Place experience

Drawing on pioneering work by Tuan (1979), Cresswell (2004) describes space as an abstract concept – generally attached to geometrical boundaries – that defines an area without any attributed meaning. Place, on the other hand, is the space after the attribution of meaning, in other words, after humans become attached to it in some way. In Cresswell's words:

> Place is a meaningful site that combines location, locale, and sense of place. Location refers to an absolute point in space with a specific set of coordinates and measurable distances from other locations. Location refers to the 'where' of place. (…) Sense of place refers to the more nebulous meanings associated with a place: the feelings and emotions a place evokes. These meanings can be individual and based on personal biography or they can be shared. Shared senses of place are based on mediation and representation. When we write 'Calcutta' or 'Rio' or 'Manchester' for instance, even those of us who have not been to these places have some sense of them – sets of meanings produced in films, literature, advertising, and other forms of mediation. (Cresswell, 2009, p. 1)

Designers and planners make extensive use of the term place, as they try to understand why some sites have more of a *sense of place* than others (Milligan, 1998). The designers' goal when dealing with these concepts is to generate that sense of place through their efforts. The sense of place, however, is generated by people's experiences of place. Cresswell (2009, p. 4) notes:

> What experience does is transform a scientific notion of space into a relatively lived and meaningful notion of place. While space was the favored object of the spatial scientist (and is still the favored object of social theorists), it is the way space becomes endowed with human meaning and is transformed into place that lies at the heart of humanistic geography.

Tuan (1979, p. 9) links such *place* experience to learning and acting:

> Experience thus implies the ability to learn from what one has undergone. To experience is to learn; it means acting on the given and creating out of the given. The given cannot be known in itself. What can be known is a reality that is a construct of experience, a creation of feeling and thought.

Cities and the built environment are important settings for place experience (Hess et al., 2008) and shared senses of urban places are created through mediation and representation in talk, action and experience (Cresswell, 2009). The concept of sense of place is central in this research as representations of good, bad, ideal, pleasant, unpleasant (micro)climates are constructed based on shared local experiences. Places become important due to the social activity they generate among the people who use and interact with and within them. This social activity and collective meaning can help find solutions to urban design challenges involving microclimate. Furthermore, future challenges regarding climate change add to the need of recognising place values and how they may inform

communities' adaptation in response to a changing climate (Fresque-Baxter & Armitage, 2012; Smit & Wandel, 2006).

The perspective described by Tuan and Cresswell – of humanistic geography – helps understand how meaning is attributed to climate and comfort through meaningful action. Being in *comfort* is a *learned* experience, and so what is considered cold in one locality can be seen as mild in another, for example, as W. B. Meyer (2000, p. 17) described:

> How much discomfort the weather causes anyone depends on that person's standard of comfort, and such standards vary greatly. One person's oppressive heat can be another's cozy warmth, one's bitter chill another's bracing freshness. So, too, the severer impacts of weather as hazard depend on more than simple exposure to a weather event. No two individuals, groups, or communities exposed to the same weather will ever be affected by it in precisely the same way. Some may be highly sensitive to it, others not at all.

The scientific notion of thermal comfort is therefore insufficient to account for how people react and adapt to microclimate (Crate, 2008; Hulme, 2008; Magistro & Roncoli, 2001; Shove et al., 2008) and has to be complemented by the *meaning of comfort*, which is closely connected to the idea of place, urbanity and liveability.

Westerberg, Knez and Eliasson (2003) have investigated people's autobiographical memories – or experience – for climate and spaces and how this may be linked to the identity of a place. This research integrated architecture, psychology and climatology and had as its objective to understand the influence of the microclimate on urban public spaces use and life through the search for answer for interesting questions:

> How ought meteorological data to be characterised with special reference to local habits and views on climate and outdoor staying? What is the climate that people bear in their minds? The individually sensed and experienced climate influences instantaneous and comprehensive assessments as well as socially and culturally transferred knowledge, ideas, prejudice and habits related to the climate. (…) At a group level, however, interpersonal experiences of the climate are expected that renders not only urban places, but also cities and regions unique climate identities. (Westerberg et al., 2003, p. 2)

Knez has extensively studied the role of climate on identity and place attachment[9], suggesting that climate has a significant impact on memories we have and meanings we attribute to places (Knez, 2003a, 2005, 2006, 2012; Knez & Thorsson, 2006, 2008; Knez et al., 2009). Knez and Thorsson (2006, 2008) examined the influence of culture (Swedish vs Japanese) and environmental attitude (urban vs open-air person) on participants experience in a square. The research concluded that "thermal

[9] Place attachment is related to the emotional bond with a physical place that has been attributed meaning through interaction (Milligan, 1998).

comfort indices may not be applicable in different cultural/climate zones without modification" (Knez & Thorsson, 2006, p. 9). Harley (2004) described that weather occasionally plays a role in organizing autobiographical memory. When studying the British discourse about the weather, Harley suggested that "although people have surprisingly strong memories of the weather, these memories are not always correct" (p. 104) and that "people's nostalgia for a particular weather event is based upon statistically incorrect data" (p. 113). The author explains:

> There is a perception that 'the weather isn't what it used to be' – The past is seen through rose-colored spectacles, and this saw [sic] is also true of people's memory of the weather. It is clear from my data that nostalgia plays an important role in people's interest in the weather. But it is a curious sort of nostalgia, because the events that give rise to it are relatively rare. (Harley, 2004, p. 109)

The experience discussed above has an individualistic perspective, as it derives from studies on psychology. However, it is interesting to note that on developing a *conceptual model*, Knez et al. (2009) considered three main organizing entities: place, moderator/mediator and human response. Place is the physical aspect – including weather –, the moderator/mediator is the collective culture, and the human response regards experience. The authors then suggest that place can directly – place influences people – or indirectly – affected by culture – influence human response. The psychology approach therefore tends to disregard that people are in many senses a *product* of the culture where they live and of their past experiences as a member of social groups. By contrast, anthropologists have brought some light to the effects of collective and cultural aspects of life on climate experience, especially regarding future adaptation to climate change (Roncoli et al., 2009).

3.3. Symbolic landscapes and symbolic interaction

The idea that the meaning of landscapes – including climate – is constructed and dependent on culture is central in this research, and reflects the crucial link between the physical aspects of place and the formation of symbolic meanings (Borer, 2010). Symbolic landscapes are defined in this research according to Cosgrove's (1984; Cosgrove & Daniels, 1988) idea that landscapes are *a way of seeing the world*, or as Brassley (1998, p. 8) describes:

> (…) a landscape is seen as a text to be read, and the reading produced will depend upon the reader and their cultural context. From this it follows that people from different backgrounds and with differing experiences and purposes in using the landscape might have varying preferences.

The power of landscape acting as a point of reference for communicating tacit knowledge has been brought to light by anthropologists and geographers. People are constantly transforming neutral spaces into places of significance (Cruikshank, 2005), and Gustafson (2001) have shown how themes such as *atmosphere* and the *climate* make places meaningful. These themes are presented in a way

that characteristics of people and their culture come to define the urban environment itself. This makes symbolic landscapes very important for studies of urban microclimate and climate change, and raises the potential for insights from the theory of symbolic interaction.

If landscapes are made symbolic through the attribution of meaning, Blumer (1969) has suggested that something becomes meaningful through human interaction. Symbolic interactionism does not see meaning as something intrinsic of the thing that has meaning, nor sees meaning as a person's psychological process. In this context, "the meaning of a thing for a person grows out of the way in which other persons act toward the person with regard to the thing" (Blumer, 1969, p. 4). Thus symbolic interactionism sees meanings as social products that are formed through the activities and connections of people as they interact.

The most important dimension of symbolic interactionism theory is that "fundamentally human groups or societies exists in action and must be seen in terms of action" (Blumer, 1969, p. 6). So cities exist through their social and material life. The way people experience the climate and consequently adapt their lives or themselves to the conditions to the climate and also therefore defined by action, and cultural adaptation to microclimate and climate is influenced by collective values, habits and memory, built through interaction. Consequently, societies collectively develop protocols of how to respond to varied types of circumstances.

In the same way, meanings of places do not reside within physical fabric but between the people who use and inhabit them (Borer, 2010). Hence symbolic interaction theory has something valuable to offer to designers. It provides a means of understanding and improving urban environments and places where people live through the understanding of its collective memory (Fine & Beim, 2007). Symbolic landscapes and local identity, which are partially a product of collective memory, are then formed through interaction.

Symbolic interaction has also been discussed from the perspective of place attachment (Milligan, 1998), architecture (R. W. Smith & Bugni, 2006) and urban design (May, 2013). The work of Smith and Bugni (2006) is particularly interesting as it emphasises that designed physical environments and people influence and find expression in each other. It also informs how designed physical environments communicate our shared symbols and meanings, revealing that designed physical environment – buildings, places, and objects – shape our thoughts.

3.4. Seasonality

Meanings of comfort and sense of place in temperate mid-latitude countries such as New Zealand are also profoundly affected by annual seasonality. Some people have grown up in cities designed for winter (Pressman, 1995), others in cities designed for summer. This past experience and self-image

of ‘belonging’ to a certain type of place can influence the development of bonds to certain types of climate and its seasons (Knez, 2005). Orlove (2004) showed from the study of twenty-six languages that in all studied cases the year was divided into seasons indicating the importance of the phenomena.

The effect of seasonality is more prominent in higher latitudes, and it is a very clear illustration of climatic adaptation. While tropical latitudes have less defined seasons and predominance of warmer days, in subtropical and temperate latitudes the cold winters can have important impacts in everyday lives. These impacts can be seen both in the practical use of public open spaces and in the meanings attributed to places and activities according to different times of the year.

The seasonal rhythms of urban and rural landscapes are different. In rural landscapes, natural seasonality as phenological phases and seasonal work are dominant, while in urban landscapes the main seasonal changing aspects are human activities (Ahas, Aasa, Silm, & Roosaare, 2005). However, although the topic has been explored in landscape research and planning, it has not been given significant attention in the urban planning and design fields. Seasonality is so inherent that we do not always pay adequate attention to it (Palang, Fry, Jauhiainen, Jones, & Sooväli, 2005). Despite the advancement of technology during the last century, people in rural or in urban environments still have to adapt to the transformation in everyday natural, human and societal environments between the seasons (Palang et al., 2005). These rhythmns are clearer in the natural landscapes, but they are also present in the way social dynamics occur in urban environments.

Reima Pietilä (as cited in Jauhiainen & Mönkkönen, 2005) has argued that the cycle of seasons has to be taken into account in order to develop a liveable town. It is clear that seasonality has a great impact on the way public open spaces are used, but modern urban planning has tried to dismiss the seasons and its meanings and emphasize functional aspects of urban planning and design. Jauhiainen & Mönkkönen (2005) have discussed how seasonality is felt by people and reflected in urban planning. Their research was based in Oulunsalo, Finland, where the differences between seasons are very evident in the landscape. The authors highlight that the perception of the exact start and the end of a season may not necessarily coincide with scientific definition of seasons. Following a similar argument, Olwig (2005) points out that the same thing happens to farmers in varied parts of the world, as it is more helpful to consider natural phenomena such as the sprouting of leaves – which are more realistic indicators of spring – than considering its start as being 21 March.

Climate and nature together also acquire meaning through activities practiced outdoors, such as tramping[10] or hiking. These activities put the person in direct contact with the geographical terrain and with the seasons. Experienced trampers know the landscape as something constantly undergoing a process of seasonal transformation (Olwig, 2005). In a different context, Pungas and colleagues (2005) have explored the meanings of the Estonian habit of swinging. The authors notice that seasonality still has a great importance in Estonian traditional habits and summertime swinging is part of this collective memory. An interesting aspect of this research is that it highlights the strengh of habits that are attached to the seasons, because the climate is not appropriate for swinging throughout the year, therefore 'the need' for swinging is preserved.

Seasons are not changeable through design, but through design we can facilitate and ameliorate the perception of seasons and therefore the use of public open spaces. Elements that have local meanings and that are attached to seasons are important clues of how locals like to use the open spaces throughout the year. This is important when planning for a liveable city, as it has to respond to weather during all seasons. In this sense, design is the tool that has the potential to allow people to experience the seasonal environment in a positive way.

Landscape architects are used to take into account in their designs changes in light, temperature and activity, seasonal changes, lifecycles, ecological successions and so on (Bowring & Swaffield, 2013). There are also planners and architects who address the importance of seasons for urban planning. Pressman (1995), for example, has stated that climate must be central in a built environment to consider a winter-oriented architecture and urban solution. However, despite its importance, in a general sense, urban planning seems not to give enough consideration to seasonality or seasonal preferences, producing 'uni-seasonal' urban environments (Jauhiainen & Mönkkönen, 2005). Indeed, the dominant approach to urban microclimate has been shaped by a desire to eliminate variability. Nonetheless seasons affect places experience, contributing to the shaping of meanings of comfort and collective memory regarding climate, and are particularly significant in the case study upon which this thesis is focused.

4. URBAN MICROCLIMATE, THERMAL COMFORT, AND ADAPTATION

4.1. Urban (micro)climate

Research on urban microclimate has gained extra attention recently with many researchers exploring the relationship between avoidance or acceptance of certain urban places and areas because of their

[10] Tramping is a New Zealand term, used to describe the activity of extended walks or 'hikes'. The term also has cultural connotations, involving connections with the landscape. Tramping is known elsewhere as 'hiking', 'trekking', 'walking', or 'rambling'.

microclimate (Eliasson, Knez, Westerberg, Thorsson, & Lindberg, 2007; Gehl, 2010; Katzschner, 2004, 2006; Thorsson et al., 2007; Whyte, 2001, 2009; Zacharias et al., 2001). Studies in this field vary across scales ranging from planning and design to perception and well-being.

The relationship between urban planning and city form, and the resulting microclimate and outdoors thermal comfort have been largely explored from a post-positivist scientific perspective (Fintikakis et al., 2011; Johansson, 2006; Steemers, 2003b; Zacharias et al., 2001; Zhou, Huang, & Cadenasso, 2011). Urban climatologists frequently address variables such as street orientation, street width-to-height ratios, building height and spacing, architectural detail of street façades, reflectiveness of surfaces, the placing of street trees and water features, and the effects of vehicle in movement (Hebbert & Webb, 2012). Other research is focused on the relationship between built form, street geometry and the role of green infrastructure in relation to its size, air pollution filtration capacity (Leung et al., 2011) and heat islands mitigation (Skelhorn, Lindley, & Levermore, 2014; Steeneveld, Koopmans, Heusinkveld, & Theeuwes, 2014). In addition, some guidelines link urban climate research findings to the practice of urban design (Erell et al., 2011; Littlefair, 2000). Nevertheless Eliasson (2000) has identified difficulties in translating knowledge from climatology and urban microclimate into urban planning, and Evans and Schiller (1996) have demonstrated these difficulties and some possibilities through three case studies in Argentina.

Many studies on urban microclimate have used a computer simulation based approach (Bruse, 1999, 2005; Huttner & Bruse, 2009; Lenzholzer, 2010; Monteiro, 2008; Robitu, Musy, Inard, & Groleau, 2006) including the exploration of opportunities for using GIS for thermal comfort (Kántor & Unger, 2010). Recent studies have also explored the relationship between urban microclimate and the relative magnitudes of building energy use in comparison to energy used on transportation means (Steemers, 2003b). Research on spatial planning (B. C. Meyer, Rannow, & Loibl, 2010) and computer modelling of land use (House-Peters & Chang, 2011) have clarified the impact of these on climate change.

The impact of vegetation on microclimate has also been extensively investigated (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Hambidge, 2008; House-Peters & Chang, 2011; Skelhorn et al., 2014). In particular Hall, Handley, and Ennos (2012) have considered the relationship between varied urban morphology types and the potential of using tree planting to make high density areas 'climate-proof'. Steeneveld et al. (2014) have examined the potential of use of water to amend microclimate, and Dimoudi and Nikolopoulou (2003) have considered the consequence of cooler urban environments on buildings' energy consumption.

Besides vegetation and water features, air temperature, solar radiation and wind in a particular location can be modified or amended by the design details of outdoor spaces (Givoni et al., 2003).

Materials and colours, provision of shade, planted surfaces and wind protection are examples of elements of the space that when carefully planned can impact on the place microclimate. Following this same logic studies have investigated human outdoors thermal comfort (de Dear, Spagnolo, Yutaka, & Tadakatsu, 2005) and the relationship between outdoors thermal comfort and human perception (Lenzholzer, 2010; Stathopoulos, Wu, & Zacharias, 2004).

Outdoor thermal comfort in an urban climate may be affected by a wide range of weather and human factors (Givoni et al., 2003; Stathopoulos et al., 2004). Weather factors and human response from individual physiological and psychological perspectives have been extensively discussed. Human perception of the landscape (Atik, Bell, & ErdoĞan, 2012; R. Kaplan, 1985; R. Kaplan & Herbert, 1987; S. Kaplan & Kaplan, 1982; Rishbeth & Powell, 2012), and health and well-being (Egoz, 2011; S. Kaplan & Peterson, 1993) have also received attention. However, the way public open spaces are used and how the use dynamics of these spaces affect adaptation to the climate have not been sufficiently explored. The collective meaning of weather, place and culture affect people's behaviour in open spaces and therefore is essential to understand the meanings of thermal comfort and adaptation, as previously discussed.

Studies that are closely related to the questions of this research are primarily focused on the design of microclimate (Brown, 2010, 2011; Brown & Gillespie, 1995; Sullivan, 2002), the relationship between shading, the thermal environment and human thermal comfort (Li, Zhou, & Ouyang, 2013), and specifically its consequences on space use (Lin, Tsai, Hwang, & Matzarakis, 2012). Despite the extensive exploration of microclimatic from the perspective of design, there has been insufficient attention to post implementation monitoring or evaluation (Brown, 2011). Landscape architecture still needs to be better informed about possibilities of designing and retrofitting a specific situation, and then be able to provide a balanced and liveable microclimate, capable of providing thermal comfort in outdoor spaces enhancing social life and economic sustainability. In general, empirical or basic knowledge related to solar geometry and prevailing wind are applied to site projects. However, while the greening intention is always present, ways of planning open spaces to effectively ameliorate the urban microclimate and improve liveability from a local perspective of comfort need further attention.

Much research on microclimate is focused on extreme climates, where there is a limiting factor to outdoor use. The role of building envelopes is also more critical in these climates, as it can make a building inhabitable or not, and increase the energy consumption. Temperate regions have received less attention, yet offer greatest opportunity for active adaptation through careful microclimate design improving the quality and use of public open spaces. Practical studies on comfort and microclimate in public open spaces are more commonly focused on hot climates (Ahmed, 2003;

Attia, 2009; Jitkhajornwanich, 2006; Johansson, 2006; Lwasa, 2010; Ratti, Raydan, & Steemers, 2003; Shashua-Bar et al., 2009; Yu & Hien, 2006) where poor design can hinder the use of open areas. In this sense temperate climates may be easier to address, as in most cases the undesirable conditions decrease the use of public open spaces, but do not completely hinder it (Bosselmann, Arens, Dunker, & Wright, 1995; Bourbia & Boucheriba, 2010; Eliasson et al., 2007; Pressman, 1995; Zacharias et al., 2001).

Silva (1994), explains that in temperate regions the seasons are well defined by climatic conditions and during part of the year the climate is mild. However, summer and winter present contrasting climatic conditions which increases thermal stress of individuals in these periods. Silva also outlines that in these climates it is not very difficult to find a design solution to satisfy both summer and winter requirements, but some care should be taken to provide a built environment able to cope with these different seasonal requirements. Barbirato, Souza, and Torres (2007) emphasise that in some situations is not possible to *design with climate*, but in most climates, when the climatic severity is not extreme, it is possible to have a good natural condition achieved from selective or conservative natural energy techniques. These authors, then, are focused on the importance of a careful design, adapted to specific situations of winter and summer. Both highlight that, if possible – and easier in some ways – to design with climate in less extreme climatic contexts, these are also the climatic regions that should use all the potential of climatic design.

4.2. Thermal comfort and its perception

The concept of thermal comfort originated from the architecture and building sciences, because bioclimatic control within human shelter is one of the most important concerns in architecture (Olgyay, 1963). Thermal comfort has been conceptualised as a condition of mind which expresses satisfaction with the thermal environment (ASHRAE, 1989). This description implies psychological variables, but most research to date is focused basically on physical and physiological concepts. In this context comfort can be understood as dynamic spatial conditions of internal and external temperature, humidity levels, and air velocity, combined with factors directly related to an individual, such as clothing type, activity level, age, gender, health condition, metabolic rate, perception, and memory (Lovell, 2010).

In Architecture, thermal comfort is usually assessed from the building science perspective, relating the building and the possibilities of saving energy while still providing thermal comfort conditions. This is because despite the effort to produce more efficient buildings, especially in the past decade, buildings have increased the total amount of energy consumed. In some regions, such as in the UK, buildings are responsible for over 50 percent of the total energy consumed (Steemers, 2003b). Thermal comfort standards are therefore necessary to indicate quantifiable values for

implementation of efficient heating or cooling systems (Roaf, Nicol, Humphreys, Tuohy, & Boerstra, 2010). Technical concepts such as heating exchange and properties of materials have also been used to understand the mechanism of energy exchange in outdoor open spaces and to assess its impact on buildings (Ratti et al., 2005; Sad de Assis & Barros Frota, 1999; Steemers, 2003a, 2003b; Yannas, 2001, 2002; Yu & Hien, 2006).

A number of indices for thermal comfort have been developed to help understand people's responses to air temperature. These indices include personal parameters such as clothing insulation and metabolic rate. Amongst these indices the most relevant ones are the *Predicted Mean Vote* (PMV) developed by Fanger (1970), which has been often used in indoor comfort research and was then improved with the focus on outdoor thermal comfort. Other new standards focused on outdoors are the *Physiological Equivalent Temperature* (PET) (Höppe, 1999, 2002) and the COMFA index (Brown & Gillespie, 1995). Although thermal comfort is defined as a *condition of mind*, all these indices are focused on physiological parameters and physical variables, not taking into account that the meanings of thermal comfort may vary in different social and cultural contexts.

The area of human biometeorology has also contributed to the studies on human comfort. Human biometeorology is the science centred on influences[11] of the atmospheric environment on man (Höppe, 1997). In the early days of studies on human thermal comfort, Chatonnet and Cabanac (1965) studied how sensation of thermal comfort is related to the expression of comfort or discomfort in different environments. The authors used a physiological approach based upon human body functioning and responses. Aiming for a more holistic approach to human thermal comfort and challenging the physiological research, Auliciems (1981) argued that studies should include parameters of past cultural and climatic experiences and expectations. More recently Lenzholzer (2010), Knez (2005), and Knez and Thorsson (2006), have improved the understanding of the meanings of thermal comfort by seeking to understand why people have different perspectives regarding places and climate. Lenzholzer (2010) investigated users' thermal perception in Dutch squares in an attempt to design squares more adapted to local climate circumstances and to local users. Lenzholzer argues that the *fixed ideas* that people have developed about the microclimate of a place should be taken into account by urban designers and landscape architects. If done so, these ideas have the potential of collaborating to a more climate-responsive and adapted design. Her work deals with thermal perception from the concept of *schemata* originated from psychology and often used in the behavioural sciences and environmental psychology, and is largely focused upon individual perceptions. In this area of interest, consideration of social and cultural phenomena such as regional identity and collective memory has not been significantly explored.

[11] These influences may be thermal, hygric, actinic, electrical or caused by the composition of the ambient air.

Outdoor and indoor spaces differ in a number of respects (E. Wilson et al., 2007) and the difficulties of controlling and amending the prevailing microclimatic conditions in outdoor spaces have been frequently outlined as a reason for limited research in this area (Monteiro, 2008; Santamouris et al., 2001; Spagnolo & de Dear, 2003; Vanos, Warland, Gillespie, & Kenny, 2010). Criteria applied in indoor environments are typically also applied in outdoor settings and used to specify individual comfort threshold values in different weather conditions (Stathopoulos et al., 2004). In addition, even when other variables such as naturalness, expectations, experience, time of exposure and perceived control are included in the analysis, they all tend to be discussed from an individual perspective (Auliciems, 1981; de Dear & Brager, 2001; de Dear, Brager, & Cooper, 1997; Lenzholzer, 2010; Nikolopoulou & Steemers, 2003).

Determining levels of outdoor thermal comfort is a complex task, however it is necessary to extend the knowledge about these issues to provide appropriate background for urban planning and design (Thorsson et al., 2007). Monteiro (2008) stresses that when considering open space designs microclimate variables may also be controlled, but that control is substantially more difficult due to partial or total lack of physical confinement. Outdoor spaces lack this confinement provided to indoor spaces by a building envelope, being exposed to winds which in turn means that temperature and air humidity cannot be completely controlled. Nevertheless, the environmental quality and performance of individual building envelopes depend fundamentally on urban environmental quality of the context where the building is located. This dependence demonstrates the importance of studies of open space microclimate as part of works concerned with thermal comfort and performance of buildings (Gaitani, Mihalakakou, & Santamouris, 2007; Santamouris et al., 2001; Stathopoulos et al., 2004).

It is clear that perceptions of thermal conditions are a vital design consideration, both indoors and outdoors. In public open spaces outdoor thermal comfort or discomfort affects people's decisions of staying outdoor and is one of the factors influencing activity and use patterns of streets, plazas, playgrounds, urban parks, and so forth (Givoni et al., 2003). Vanos (2010) has explored the importance of appropriate outdoor environments as motivators for physical activity highlighting the importance of making use of "current knowledge of bioclimatic urban design, which must be synthesized with physiology, psychology and microclimatology" (Vanos et al., 2010, p. 1). In this case the author is focused on the practice of physical activities in outdoor spaces and then physiology, psychology and microclimatology can be listed as the most important factors. However, when the focus is on choosing places for lingering and play, the influence of social interaction and preferences on adaptation to the climate have to be taken into account (Stevens, 2007).

The recognition that there is a wide variability of environmental conditions and comfort thresholds in outdoor environments has led to the adaptive models of thermal comfort. These models are a result of the understanding that people's response to climate is dependent on – and therefore variable across – cultures (Chappells & Shove, 2005; Hitchings, 2009; Knez & Thorsson, 2006, 2008; Nguyen, 2013; Nikolopoulou & Lykoudis, 2006; Shove, 2003; Wilhite, 2009), and that comfort thresholds are more variable when dealing with outdoor urban environment (Ahmed, 2003; de Dear et al., 2005; Givoni et al., 2003; Honjo, 2009; Nikolopoulou & Steemers, 2003). The next section explores these adaptive models of thermal comfort.

4.3. Adaptive models of thermal comfort

Adaptive models consider factors beyond fundamental physics and takes into account the interaction between physiology and thermal perception (de Dear & Brager, 2001). Two main approaches have been identified regarding adaptive models. The first applies assumptions and models developed and associated with indoor thermal comfort to the outdoor environment. The second approach accepts that variables related to semi-outdoor and outdoor spaces also affect thermal perceptions as much as the conventional variables taken into account to indoor thermal comfort (de Dear et al., 2005). In this sense thermal physiology and heat-exchange models of thermal comfort are components of the adaptive model (Roaf et al., 2010).

Webb, Humphreys and Nicol are considered the forerunners of the idea of adaptive comfort (de Dear, 2010, 2011). Their studies developed in the 1960's showed that thermal comfort depended more on the mean temperatures to which these individuals were exposed than on the room temperature itself (de Dear, 2010; Humphreys, 2007). They generated extensive field data from Singapore, Baghdad (Iraq), Roorkee (North India) and Watford (UK) and noticed that respondents in all case studies were comfortable with the mean conditions they experienced (Roaf et al., 2010). There was large variation on climatic conditions across the case studies and the respondents had adapted to the experienced conditions. Adaptive comfort can therefore be understood as the adjustment of the human body and its metabolism to live comfortably in a much wider range of temperatures than what we think of as *normal*. This usually happens over a period of a few weeks or months, such as seasonal changes (Lovell, 2010).

Auliciems (1981) highlighted significant disparities between existing physiological models at the time and integrated bodily responses, pointing out that stimuli in outdoor environments are more diverse than in indoor environments, and are related to physiological adaptation (acclimatisation), behavioural (adjustment), psychological (expectation) and cultural (technology). A key feature of the adaptive model is that it considers the person is not just a passive recipient of the thermal environment, but an active agent interacting with the environment (Brager & de Dear, 1998). This

model also considers that contextual factors and past thermal history modify building's occupants thermal expectations and preferences, meaning that people in warm climate zones prefer warmer indoor temperatures than people living in cold climate zones, for example (de Dear et al., 1997). However, the psychological (expectation) aspect of adaptation is again considered at an individual level, and the cultural aspect taken into account is related to available technologies, both in buildings and clothing. This approach disregards meanings related to collective memory and identity. Comfort conditions outdoors and human perception of thermal comfort is more flexible than purely scientific measurements resulting of the application of comfort indices (Nikolopoulou, 2001; Nikolopoulou & Lykoudis, 2006; Nikolopoulou & Steemers, 2003; Walton, Dravitzki, & Donn, 2007). Consequently, a quantitative approach is insufficient to fully explore the complexity of urban environments.

Hitchings (2009, p. 5) argues that "senses of comfort are to be understood as the outcome of a global patchwork of contexts, each with a potentially unique combination of human expectation and adaptation". In this sense, qualitative approaches to current users of specific urban spaces have the potential of identifying sensitive ways of guiding societies towards more sustainable futures. An interesting aspect of this approach is that instead of seeing the diversity of contexts as a problem, the author believes that the limits of contextual studies have to be recognised and celebrated "because safeguarding certain forms of geographical and cultural diversity is presumably a large part of the wider sustainability objective" (Hitchings, 2009, p. 5). For this reason when observing cultures we should always remember that we see the world less 'as it is' and more 'as we are' (Triandis, 1994). This belief supports the idea that depending on the experiences we have had and the habits we have developed, we see events differently. Our perception of climate is also related to our past experiences and the meanings attached to some places and activities.

Auliciems (2009, p. 235) has stated that "given the uncertainty of both climate change and human responses, it is emphasized that adaptability of society and individuals is preferable to attaining adaptation to particular environmental conditions". The author also points out that "recommendations for survival strategies should give preference to flexible measures that encourage adaptability to change, rather than adaptation specifically to a warmer world" (p. 262). The requirements of current times are clearly more focused on survival than in comfort *per se*. Understanding the background and real needs of specific cultures can contribute to their adaptation to the natural environment instead of forcing – in many cases unnecessary – controlled environments. This means less energy applied in controlling environments but also and most importantly in the scope of this research, allowing locals to enjoy their outdoor environments and being better prepared to adapt to future climate change.

The adaptive model is an important contribution to understanding the variables involved in the perception of the thermal environment that make thermal comfort, especially in outdoor environments, more flexible than the narrow thresholds previously assumed. It seems that the cultural variables involved in the process of perceiving the climate were present in the early studies about the adaptive model (Fountain, Brager, & de Dear, 1996). However, as the model developed the processes of adaptation were reduced to individual perception of the environment, disregarding the importance of collective meanings and identity and the role of social life on the perception and adaptation to the climate. Adaptation is stimulated when individuals wish to enjoy the urban environment; therefore urban spaces must provide people with good reasons – which may vary across cultures – to use public open spaces. In this work I seek to refocus attention upon collective aspects of adaptation, and in the final section of this chapter I present an integrative model of urban comfort.

5. ADAPTIVE CAPACITY

Adaptive capacity refers to the ability of systems and people to adapt to cope with stress (Denevan, 1983). Work on adaptation can refer to many different scales, varying from individuals to general climate stresses, addressing adaptation of communities to multiple stresses, or to even to the vulnerability of the global ecosystem. Applications also vary according to the phenomena under observation – biological, economic, social, and so forth; and to time – day, month, year, decade, and so forth (Smit & Wandel, 2006). *Adaptive capacity* is also dependent on systems, sectors and regions, as it varies according to specific characteristics, as described by Yohe and Tol (2002): available technology for adaptation; availability and distribution of resources; structure of critical institutions – decision-making authority, and decision criteria; and human capital including education and personal security. Under this broad lens, the concept can be applied in many different scenarios, including potential for adaptation to diminish energy consumption, or to increase the use of public open spaces.

Recently, however, the most common application of the term *adaptive capacity* is in climate change studies, and it is frequently investigated along with vulnerability and resilience (Adger & Vincent, 2005; Grothmann & Patt, 2005; Kalikoski, Quevedo Neto, & Almudi, 2010; Smit & Wandel, 2006). Adaptive capacity in this context is as much a collective as an individual challenge. “A collective action approach focuses on the collective dimensions of place identity, and how it may influence the process of how people come together to address climate change” (Fresque-Baxter & Armitage, 2012, p. 9). It therefore considers the role of place and culture on understanding the causes, meanings, and human responses to climate change at a collective level (Adger, Barnett, Brown, Marshall, & O'Brien, 2013).

In the scope of this research, the concept of *adaptive capacity* refers to the capacity people have of adapting to the existing thermal environment, even if it is thermally imperfect – i.e. outside the comfort zone. Comfort zone is the range of relative humidity and temperature where humans experience a thermal neutral sensation, for heat or cold (Givoni, 1992; Lamberts, Dutra, & Pereira, 2004). In some situations the comfort zone can be extend in ways that reduce rather than increase resource consumption (Chappells & Shove, 2005; Yohe & Tol, 2002), and provide comfort in public open spaces. It has also been argued that comfort varies between developed and developing countries (Givoni, 1992). This variation corresponds to local responses to climate, considering local lifestyles and available technologies, and the role of local cultures in this context has not been sufficiently explored, especially regarding adaptive capacity.

Outdoor microclimate cannot be as controlled as indoor ones, making people's adaptation to the microclimate an important strategy when choosing to use public open spaces. The dimension of adaptive capacity that is fundamental in the scope of this research regards urban spaces and how people adapt in order to enjoy them. Cities provide a range of stimuli that may influence people's desire to stay in these environments. The choice for staying in a place depends on the elements of urban life that offer the needed stimuli for adaptation, and vary across cultures. Some cultures might prefer more vibrant spaces with higher density of people and buildings; others might prefer more natural and peaceful spaces in their daily lives. Responding to this and other cultural demands for aesthetics, atmosphere of public open spaces and density through design can help extend human adaptive capacity in public urban spaces users.

6. A FRAMEWORK FOR URBAN COMFORT

I have argued that social patterns and meanings of thermal comfort that impose a specific cultural adaptation must be understood as an achievement (Shove, 2003). Along with preferences for urban life and environment, this *achievement* generates the concept of *urban comfort* formulated in this work. *Urban comfort* draws together major disciplinary areas: cultural geography, cultural anthropology and urban studies – from the perspective of place experience and regional identity – and thermal comfort – from building science and urban design perspectives. It is defined as a combination of human thermal comfort, urban life and place related meanings, including cultural adaptation to microclimate, and extends the examination from individual judgement of thermal comfort to a collective approach. In other words collective meanings developed in a certain time by a certain community affect these people's experience of climate. In this research, I explore if and how this climate experience is related to local symbolic landscapes and affected by social interaction. The meanings of a *good climate* and *comfort* are investigated and related to the built environment

solutions. The conclusions may offer possibilities for adjustment and adaptation, and produce environments capable of extending urban comfort in Christchurch.

Figure 1 shows how all these elements come together to define the concept of urban comfort. To achieve this outcome the urban environment has to provide the appropriate stimuli and level or urbanity according to the local culture and values, and to be congruent with the local lifestyle, thus promoting both urbanity and liveability.

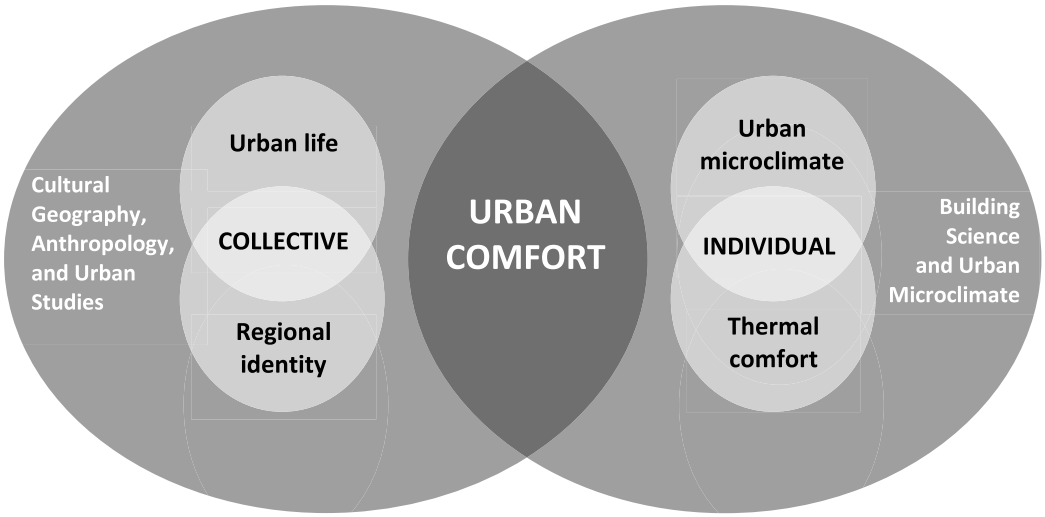


Figure 1: A framework for urban comfort

7. SUMMARY

In summary, the focus of this research is *urban comfort* as a theoretical construct that means the collective socio-cultural experience and response to microclimate in an urban environment, as a result of its local culture and preferences for urban life. Urban comfort also depends on adaptive capacity. The majority of studies about microclimatic design, both in architecture and urbanism disciplines, are centred on the biophysical dimensions of human comfort, energy demand and sustainability concerns. However, these pay insufficient attention to how in different cultures, with different thermal conditions and lifestyles, people shape their lives to better adapt to climatic conditions. Furthermore, human requirements according to climatic conditions are variable, demonstrating how climate can shape people's lives and local cultures.

In this chapter I have presented concepts drawn from urban studies, cultural geography and anthropology, and compared these with work published in urban climate and thermal comfort studies. The (lack of) relationship between these areas is notable. While the humanistic research investigates the relationship between people and environment considering matters related to climate change, it does not consider aspects related to human thermal comfort. The building science and microclimate design literature deals systematically with biophysical factors using numbers and exact measures, but tends to disregard the human aspects and meanings of comfort.

The chapter discussed previous research on topics that are important in the context of this research. The first topic is urbanity, which is shaped by urban life and lifestyles, and is fundamental to provide liveability. The second topic is culture and how it shapes and is shaped by regional identity, place experience, and meaning of landscapes and seasons. It also presented studies related to urban microclimate, thermal comfort adaptive models and adaptive capacity. The chapter concluded with a proposed framework to investigate urban comfort, which addresses the gap between the cultural and collective elements that shape comfort, and the physiological and individualistic aspects of it, and considers the possibilities of adaptation. The next chapter presents the methodology applied in this research.

CHAPTER THREE: Interpretive, integrative and adaptive methodology

1. INTRODUCTION

Studies of human responses to microclimate in outdoor environments are usually and typically focused on thermal comfort methods. These modelling and experimental methods are based upon controlled environments and measurements, and while they work well for technical investigations of indoor environments, they are not well suited to understanding the experience of people using public spaces in the city. In order to address the research questions I used an interpretive strategy and a combination of methods. This chapter introduces the research strategy which adopted an interpretive, integrative and adaptive approach. The research design was based upon a multi-method case study explored through ethnographic methods and microclimatic data collection. The challenges and limitations of the method and the ethical concerns are also discussed.

2. RESEARCH STRATEGY: INTERPRETIVE, INTEGRATIVE AND ADAPTIVE

The overall approach to this research is interpretive, integrative and adaptive. Interpretive strategies aim to "make sense of the phenomena" (Deming & Swaffield, 2011, p. 152) enhancing the "understanding of meaning and context" (Deming & Swaffield, 2011, p. 30). They are not intended to develop instrumental theory – for prediction, control and practical action – but to be critical, challenging what is known and stimulating reflection and change (Deming & Swaffield, 2011). An interpretive strategy is appropriate for this research as I seek to understand the relationship between culture and climate experience through the investigation of socio-cultural meanings and practices. The strategy focuses on making sense of *why* people respond in certain ways to specific microclimates and urban environments.

The research strategy is also integrative as it uses a multi-method approach. The methods applied are based upon a combination of ethnography and microclimate studies. The intention was not to control variables, but to identify relationships between socio-cultural and physical environments that provide *urban comfort* and therefore are important to inform the future design of a liveable and sustainable city. For this reason microclimatic data was also measured and then compared to the general patterns of human activity in the case study sites and to their experience of the weather.

An adaptive approach was necessary due to the post-earthquake environment in which the investigation was carried out. The city was still experiencing aftershocks and as a consequence the methods adopted had to be both robust and flexible. Throughout the 18 months of fieldwork (October 2011 to April 2013) sites were opened, others closed, some demolished and others

underwent significant renovations. These testing conditions required the research strategy as well the researcher to be adaptable to changing circumstances and new opportunities.

Previous research has illustrated that depending on the climatic region, the practical human *comfort zone* is frequently difficult to predict from general models usually applied in thermal comfort research (Jitkhajornwanich, 2006). Therefore comfort is dependent on the geographical and cultural context where people live. Microclimatic scale is also very sensitive to design variations, influencing human thermal experience. In the human thermal comfort field, Brager and de Dear (1998) emphasised that while indoor studies have the advantage of carefully controlled conditions, field studies are best used for assessing the potential impacts of behavioural or psychological adaptations as they occur in 'real-world' settings.

Following this rationale and the idea that "responses to the microclimate may be unconscious, but they often result in a different use of open space in different climatic conditions" (Nikolopoulou, 2001, p. 2), I use a range of ethnographic methods in this research. The main objective of ethnographic research is the exploration of people's lifestyles (Stebbins, 1997) and understanding how these lifestyles helps to understand the interaction between people and climate.

The combination of a range of qualitative methods (ethnography) and quantitative methods (microclimate data collection) brings this work into the spectrum of *abductive* interpretation. Abductive strategy is that which the focus of the research does not fit into inductive measurement or deductive derivation. This approach frequently combines qualitative research with certain technologies, to search for unknowns and develop a new structure of relationships (Schöbel, 2006). The combination of these varied methods results in "qualitative science [which] not only affects the understanding of the cultural context, but also, because of its methodological requirements, the ideas behind landscape architecture" (Schöbel, 2006, p. 1).

3. MULTI-METHOD RESEARCH DESIGN

Research design is the 'glue' that holds together the elements of a research project (Trochim, 2006). It is how the study is planned, "the logical order or structural composition of an investigation; essentially it is a formal, or a formulaic protocol" (Deming & Swaffield, 2011, p. 3). It addresses how the data will be collected and analysed and how the 'empirical' material will be selected and used in a way to answer the research questions (Flick, 2006). My research design was based upon multiple embedded case studies (Yin, 2003) and multi-method data collection. The research is focused on people's relationship and experience of climate and urban environment based upon urban life and lifestyle, regional identity and urban microclimate. Therefore the research design had to capture

people's experiences while providing insights about the physical characteristics of the microclimate these people were immersed in.

The relationship between urban life and lifestyle, regional identity and urban microclimate combined with the current post-earthquake urban environment was investigated through participant observation and in-depth interviews in various locations throughout Christchurch. Measurement of microclimatic data while the interviews were carried out made feasible the exploration of connections between the experience described by interviewees and the actual microclimate.

The fieldwork started with a pilot study which comprised participant observation to identify general social activity and people's reactions to climate in a case study framework. Pilot in-depth interviews were conducted and the mechanisms for collecting microclimate data were tested. The pilot study was then expanded to 86 in-depth interviews. The next sections describe the choice and organisation of case studies, the approach to microclimate and a short intervention implemented in a case study site.

3.1. Case study

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context (Yin, 2003). It is "an intensive study of a single unit or a small number of units (the cases), for the purpose of understanding a larger class of similar units (a population of cases)" (Gerring, 2007, p. 37). Carrying out case study research is a complex task because it lacks a standard routine of procedures, requiring researchers to feel comfortable in addressing uncertainties during the course of a study (Yin, 2003). The evidence from multiple cases is often considered more compelling and robust as it allows comparisons (Deming & Swaffield, 2011; George & Bennett, 2005; Gerring, 2007; Yin, 2003).

Yin (2003) classifies case study design into four main types: single-case (holistic), single-case (embedded), multiple-case (holistic) and multiple-case (embedded). Figure 2 shows how these types of case studies are conceptualised according to the number of case studies and embedded unities.

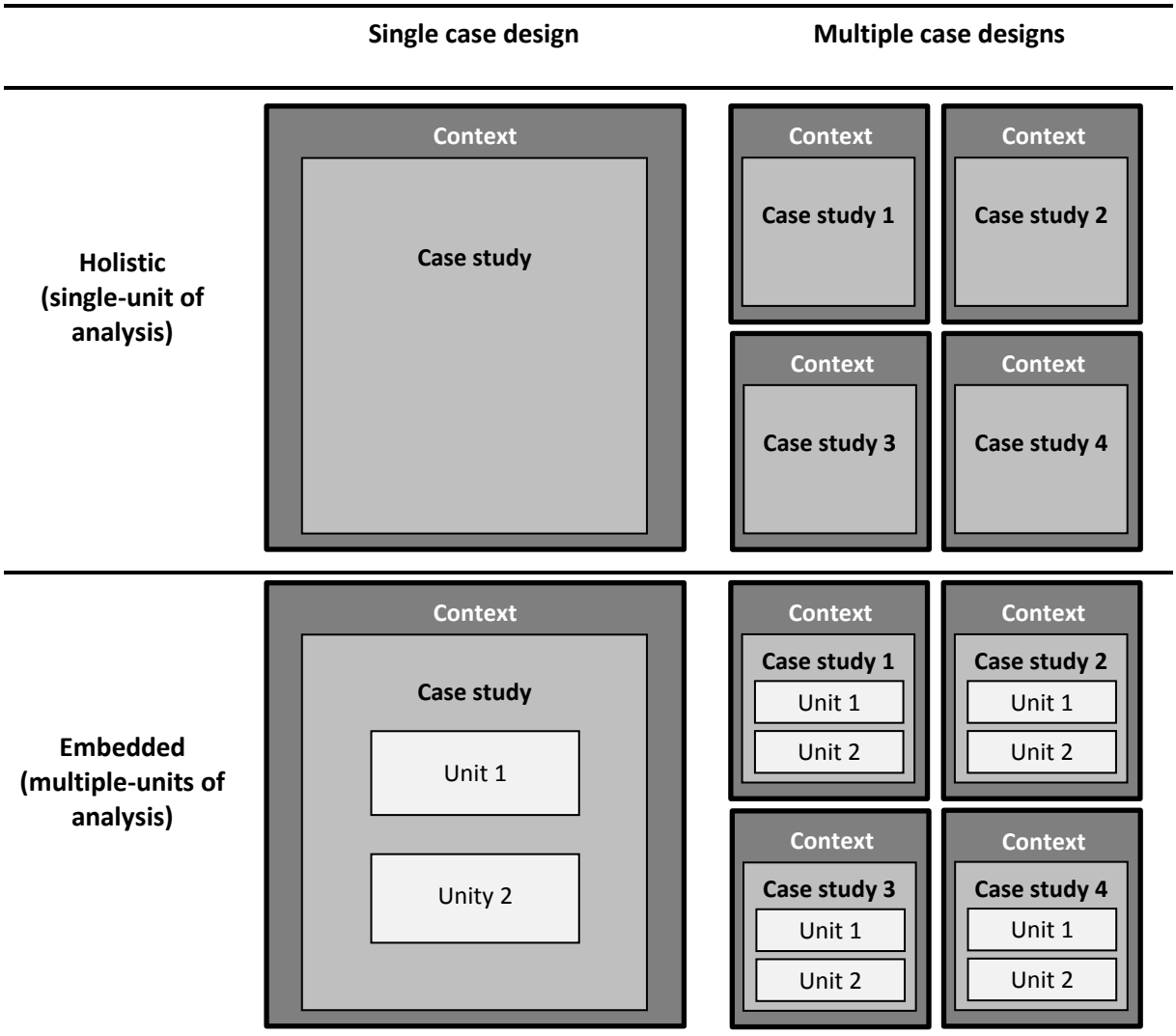


Figure 2: Types of case study design (adapted from Yin, 2003, p. 46)

George and Bennett (2005) have recommended typological theories as a way of dealing with complexity based upon the integration of within-case analyses and cross-case comparisons. This context-based expertise is necessary in dealing with policy focused on local problems and can be produced by case studies. Therefore, case studies are fundamental to allow the development from rule-based to epistemic theoretical construction, as Flyvbjerg (2006, p. 223) states:

> It is not that rule-based knowledge should be discounted (…). But to make rule-based knowledge the highest goal of learning is regressive. There is a need for both approaches. The highest levels in the learning process (…) are reached only via a person's own experiences as practitioner of the relevant skills.

The idea of *within-case* (George & Bennett, 2005) or *embedded cases* (Yin, 2003) is applied in this research as I explore the variables that shape Christchurch residents' *urban comfort* through multiple case study sites (the units) within the case studies. Four case study sites were selected to represent public open spaces that attract public use making feasible the investigation of the meanings of urban

comfort in Christchurch (Tavares et al., 2013b). These four key parts – the case study sites – help improve the understanding of the general phenomena (Gerring, 2007; Yin, 2003).

The definition of the case study sites – or the units of analysis – was related to the initial research questions. The central questions of this research and the relevant data for answering these questions were related to the meanings of physical and social landscapes, the local (urban) culture and what constitutes urban comfort in Christchurch. At the time of this research, the post-earthquake urban condition of the city was disrupted and then urban comfort was affected by the changing landscape. The choice of case study sites around the city was influenced by this condition. The four chosen case study sites are not perfectly representative of the character of all public open spaces in Christchurch, but were selected as diverse cases exploring a range of variation (Gerring, 2007; Yin, 2003) of the urban environment at the time of this research. The case study sites vary by their post-earthquake condition (*emerging urban settings* and *established urban settings*) and their urban form (*building-defined street* and *landscape-defined street*).

Figure 3 shows the relationship between the context, case studies and units that constitute the case study of my research. Christchurch is the research context and each case study corresponds to the established or emerging nature of sites within this post-earthquake context. These case studies are used as a means of understanding the overall complex phenomena related to the locals' experience of climate and the current post-earthquake nature of the city. Furthermore, each case study has embedded cases that elucidate the users' perceptions within the urban contexts in a local scale.

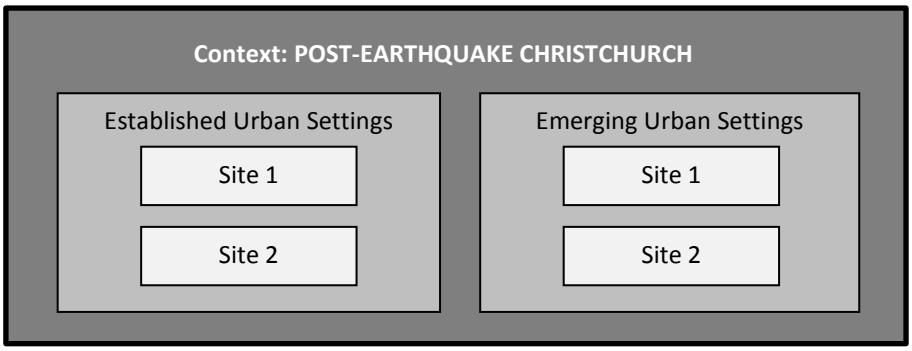


Figure 3: Multiple embedded case study (based on Yin, 2003, p. 46)

The physical condition of the site, or their post-earthquake condition, was the first criterion for site selection. The fieldwork started in October 2011, eight months after the Christchurch February earthquake – which destroyed large parts of the central city and suburban areas. At that time three case study sites within *established urban settings* were chosen, one of them was later disregarded. These sites suffered minor damage in the earthquake and were reopened shortly after the event. Other locations were being reopened or closed after being assessed regarding building damage; and new temporary sites were constantly emerging around the city. The role of these *emerging urban*

settings was to keep the city alive and functioning. I wanted this diversity of settings – both established and emerging – to be captured in my fieldwork as their differences allowed the investigation of how locals were adapting to a dynamic urban landscape in constant change. It also allowed the investigation of strategies local residents were using to adapt in times of disruption and instability following a major post-disaster scenario. This was a key feature of the current *urban comfort* in Christchurch and has been captured in the fieldwork.

The second criterion was the urban form of the case study sites, especially how it influences people's experience of the local microclimate. Both established and emerging urban settings have two embedded case study sites: a building-defined street and a landscape-defined street. The building-defined street is a street space mostly configured by the building façades. These are streets that have the form and dynamics similar to main streets in the pre-earthquake central city. The case study sites chosen following this criteria are Rotherham Street – a north-south oriented street – and Cashel Mall – an east-west oriented street. Building-defined streets offer less flexibility regarding urban design and the attraction for the area is generally anchored by social activity and/or uses in the buildings adjacent to the footpath. Conversely, the landscape-defined streets offer more space and flexible urban form, allowing the possibility of creating open spaces. The first case study site chosen following this criteria is Windmill Centre, which is predominantly constituted by a hard landscape with its use based upon a car park, offering minimal aesthetical attraction. What Windmill Centre offers is a controlled microclimate as it faces north and is protected from prevailing cold winds. The second landscape-defined street is South Colombo Street, a small park area improvised in a corner where buildings have been demolished. The landscape-defined street is in general a space adjacent to a street where the characteristics of the site itself are a strong reason for choosing or avoiding the area.

The four cases chosen and their urban dynamics at a defined period of time – October 2011 to April 2013 – allowed the investigation of several variables related to the concept of urban comfort:

1. How locals were adapting to the dynamic and highly changeable post-earthquake environment;
2. The role of microclimate and its influence on the use of public open spaces;
3. The role of greenery and its influence on adaptation and choice for places;
4. Different qualities and types of urban settings and urbanity, and the types of people they attract;
5. Variation of urban design solutions and its resulting microclimate.

The detailed choice for the interview locations depended on the presence of a business where the equipment for climate data collection could be safely placed. Cafés became the focus due to the

nature of the urban sites and the fieldwork subsequently showed the dependence of these areas' activity on the local coffee culture (Tavares et al., 2013b).

Data from the case studies was gathered using a range of research methods (see Section 4). Participant observation in the various case study locations allowed the understanding of their urbanity and the dynamics of urban life. Factors affecting choices in the city and the role of microclimate on these places' use dynamics and users' choices were explored through the interviews. These data informed the identification of themes related to meanings of urban comfort, which were analysed and related – through the interview data itself and literature – to local identity.

This research utilises a comparative method following Gerring's (2007, p. 28) *covariational typology*, as it consists of several cases where there is no temporal variation. The selected case study sites are typical of post-earthquake Christchurch urban environment, including more and less damaged areas. Table 1 shows the matrix of case study sites based on the post-earthquake condition of the site and their urban form.

		URBAN FORM	
		Building-defined street	***Landscape-defined street***
POST-EARTHQUAKE CONDITION	***Established Settings***	Rotherham Street (Riccarton)	Windmill Centre (Riccarton)
	Emerging Settings	Cashel Mall (Central City)	South Colombo Street (Sydenham)

Table 1: Matrix of case study

The varied characteristics of the sites required a different type of approach to the fieldwork itself, particularly the participant observation. In the sites that have the configuration of a street, the participant observation covered aspects of the street itself, not just a particular section of it. In these cases interviewees were recruited from people using public benches, walking on the street or sitting in the café where the weather station was placed. In the case study sites that are modified street areas most of the outdoor activity happens because of the café placed in the site, thus the participant observation was focused on a smaller area.

Furthermore, each site needed to have a location where I could be based and encounter people. I therefore selected sites with a café with an open area adjacent to the street. The café served three main purposes: as a host for the weather station, a power source for the data logger computer and as a convenient focus where people often gather, making these café settings ideal for conducting interviews. Permission to carry out the fieldwork in each of the case study sites was provided by café managers and administrators of the commercial areas where these cafés were located.

4. RESEARCH METHODS

This research used two main methods: ethnography (participant observation and in-depth interviews) and microclimatic data measurements. These methods had the objective of exploring the role of place, symbolic landscapes and symbolic interaction on the experience and preferences for local microclimate.

4.1. Ethnography

Ethnography is a "methodological choice which privileges an engaged, contextually rich and nuanced type of qualitative social research, in which fine grained daily interactions constitute the lifeblood of the data produced" (Falzon, 2009, p. 1). Ethnography seeks to provide an account of cultural or social phenomenon through critical observation and reflection (Deming & Swaffield, 2011). The methods utilised are mainly based upon a combination of field techniques – fieldnotes, audio-visual, interviews, observation, and so forth – rooted in the ideal of participant observation – to live and be part of the situation (Falzon, 2009). In this research I applied participant observation and semi-structured in-depth interviews.

> Ethnographic researchers do not much actively 'procure' specific data for recording as they seek to register the events and behaviours unfolding, or the words being spoken, before them. This does not mean that field researchers simply wait for 'significant' (sociologically or otherwise) events to occur or words to be spoken and then write them down. Rather (…) fieldworkers attempt to position themselves to facilitate observation of matters of interest (…). (Lofland, Snow, Anderson, & Lofland, 2006, p. 81)

Ethnography is based upon relations of trust and a belief that data are produced in and of *thick* interaction between researchers and researched (Falzon, 2009). As Geertz (1973, p. 10) points out:

> Doing ethnography is like trying to read (in the sense of 'construct a reading of') a manuscript-foreign, faded, full of ellipses, incoherencies, suspicious emendations, and tendentious commentaries, but written not in conventionalized graphs of sound but in transient examples of shaped behavior.

These examples provide a rich description of the situation being studied. The amount of information that goes into ethnographic description of even the most elemental sort shows how thick it is (Geertz, 1973). Marcus (1995) has challenged the concept that ethnography has to involve the idea and practice of a relatively long term stay in a field site of choice, and in a recent book Falzon (2009) systematised the *multi-sited ethnography* which breaks with this convention. Marcus (1995) argues that multi-sited ethnography makes possible the study of social phenomena that cannot be explored through the study of a single site, as Candea (2009, p. 26) described:

> Multi-locale/Multisited ethnography implies a reconfiguration of the 'traditional' anthropological method of intensive participant observation in a single bounded location (…). The single-sited methodology, its sensibility and epistemological presuppositions, were no longer felt to be adequate to the realities of an increasingly mobile, shifting and interconnected world.

In the scope of this research, Falzon's (2009, p. 4) claim is of special interest, as he points out that "contemporary research has to come to terms with the idea that, logically, if space is produced, there is no reason why the space of ethnography should be exempt". This perspective puts the processes of studying the production of space and place based upon multi-sited research in an important position. Moreover, ethnography also captures lived experiences and cultural meanings associated with climate (Roncoli et al., 2009). The correlation between adaptation and meanings of comfort associated to urban quality and climate has to be explored through a range of different urban contexts. To explore these relationships I adopted an ethnographic multi-sited approach based upon participant observation and in-depth interviewing methods (in multiple embedded case studies) associated with microclimate data collection.

Participant observation

Participant observation "refers to the process in which an investigator establishes and sustains a many-sided and situationally appropriate relationship with a human association in its natural setting for the purpose of developing a social scientific understanding of that association" (Lofland et al., 2006, p. 17). The adoption of participant observation was focused upon understanding the strategies locals use to adapt to the weather. It also provided information about the general activity in the case study sites which was then related to the general climate – measured at NIWA[12] Kyle Street Weather Station – and the local measured microclimate data.

Every day in the field started with participant observation for at least one hour. The process of taking fieldnotes varied according to the site's urban form. In the building-defined street the notes regarded the activity in the street itself as well as the open area of the cafés; therefore I walked along the street and stopped in some strategic points to take notes. In these sites I acted more as an *observer* than as a *participant*, as it is easier to blend into the street activity while still observing. The interaction with users of the space was less frequent. In the landscape-defined street, on the other hand, as the activity of the place relies more closely on the activity of the café, I used the cafés' outdoor areas as my base for observing. In these settings I was more of a *participant observer* as most of the time I was using one of the tables and interacting with customers, waiters, waitresses

[12] NIWA (National Institute of Water and Atmospheric Research), is a Crown Research Institute established in 1992. Crown Research Institutes (CRIs) are Crown-owned companies established to undertake scientific research and related activities in accordance with the Crown Research Institutes Act 1992 (NIWA, Taihoro Nukurangi, 2013c).

and managers. In all settings simplified sketches in plan view were produced. These sketches were aimed at understanding the spatial relationships between built elements, microclimate, people choices for places, and walking routes. They were then analysed along with the photographs taken during the field work.

After that first hour the fieldnotes were generally taken when I was not interviewing. By the end of 18 months of fieldwork I had completed four notebooks of notes from the field. These notes included information about the number of people in the settings, predominance of age and gender according to times of the day, busier times and main activities. Lofland et al (2006, p. 110) suggest that full fieldnotes – "all those mental notes and jottings are not fieldnotes until you have converted them to a running log of observations" – should be written no later than the morning after the observation day, because to wait one day or more means to forget a large amount of material. In this research I kept one summary page for each day in the field which was written just after the fieldwork day. This page was a reflection about the main activity and general dynamics of the studied case site and about what I saw during the day. Each of these pages had a summary at the end with general information about age, gender, peak times and climate variation throughout the day. I have also taken many photos throughout the fieldwork and recorded general climatic data assessed through the MetService iPhone application[13]. This information was later compared to the microclimatic characteristics of the sites and the NIWA data in specific points in time (See section 4.2).

Interviews

Semi-structured and in-depth interviews were used as a way of exploring the relationship between people and climate. In semi-structured interviews the researcher makes use of an interview guide consisting of a list of open-ended questions in a flexible order. These questions guide the conversation without forcing the interviewee to select pre-established responses (Lofland et al., 2006). Semi-structured interviews were appropriate for this research as they allow interviewees to express their thoughts in a structured *conversation*. Moreover, an in-depth format allowed the exploration of the complex and culturally nested studied phenomenon, which is not easily captured by snapshot assessments and structured surveys (Roncoli et al., 2009).

Participants were approached in the case study sites without any previous arrangement. If they agreed to participate they were given a research information sheet (see Appendix 4) and asked to sign a consent form (see Appendix 5). Following these first steps, the interview was guided by topics covered on the interview guide and related to personal background, the value of outdoor settings, the Garden City image, the role of climate on daily choices, thermal comfort at the time of the

[13] Available at: http://about.metservice.com/about-metservice/ways-to-get-the-weather/weather-on-your-/smartphone-apps/

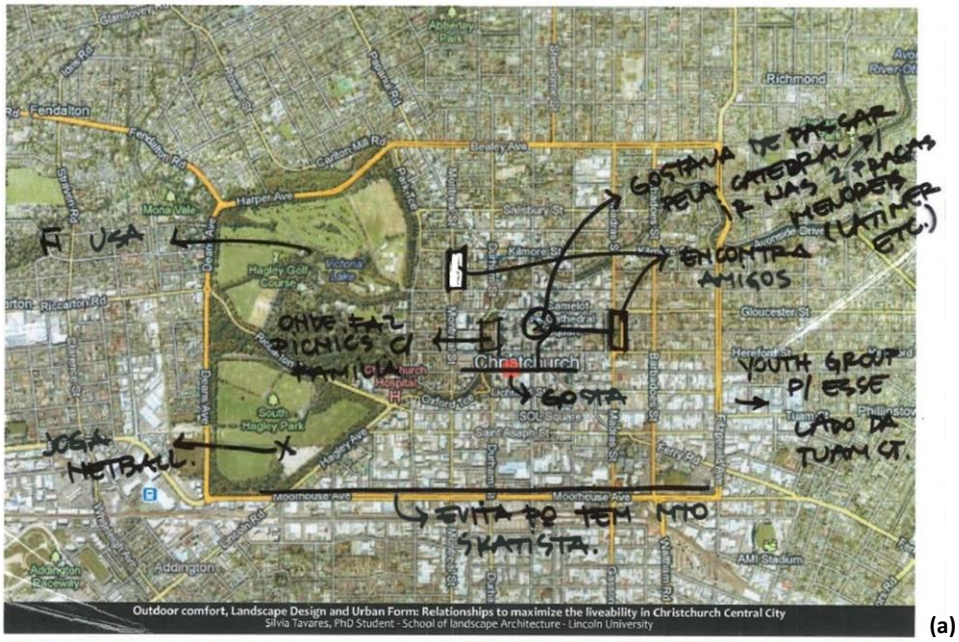
interview, the significance of the climate on the choice for the area, the influence of other people using the setting, qualities of the urban setting, future of the central city and lifestyle (Appendix 2).

At the end of the interview I presented a map placed in a plastic pocket (Figure 4 and Appendix 6) where the interviewees could draw their favourite routes – especially walking routes – favourite and least favourite places. Their description was also recorded and shortly after the interview, while still in the field, I added notes on the map (notes were taken in Portuguese). The mapping exercise was intended to explore the most remembered and preferred places and routes, and how that preference was connected to the climate experience and qualities of place. These maps supported the analysis of preferred types of urban environment mentioned or described in the in-depth interviews.

After the interviews I filled the *post-interview field notes* page with information about the interviewees clothing and accessories, strategies to keep warm or cold (e.g. consuming hot or cold drinks), place of choice to linger and general attitude regarding satisfaction, dissatisfaction and so forth (see Appendix 7). These post-interview comment sheets are described by Lofland (2006, p. 103) as follows:

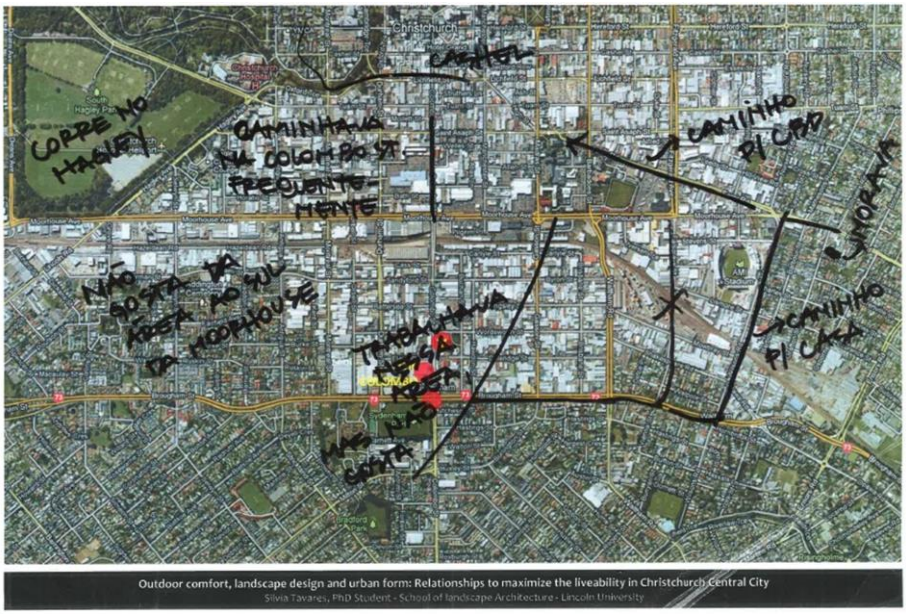
> It is simply a space for you to jot down field notes on the interview itself after you and the informant have parted. You may include a description of the setting (if it is new to you) and the informant (…), the emotional tone of the interview, any particular difficulties (methodological or personal) that were encountered, your own feelings during and about the experience, insights and reflections and so on.

A different group of interviewees were the managers of the cafés in the case study sites and one extra café around Christchurch – Smash Palace Café – which has been taking action to help customers adapting to the climate in the transitional situation of the city. These managers were key informants and their interview guide was very broad and general. The topics covered included the post-earthquake condition of the sites and establishments (regarding change or novelty), actions towards customer adaptation to the climate, changes in patterns of use regarding these actions and so forth (for guide see Appendix 3).



(a)

(b)



(c)

Figure 4: Examples of mapping exercise: Cashel Mall (a), Rotherham Street and Windmill Centre (same map for both sites) (b), and Sydenham (c)

Recruitment of Participants

Participants were selected in two different ways. Mainly, participants were selected from people using open spaces, especially the ones *enjoying* the urban environment and were recruited face-to-face. In these cases the selection of participants varied according to the case study sites – building-defined street or landscape-defined street – some participants were interviewed in public areas and others in open areas of the cafés adjacent to the street. In some case study sites it became clear that interviews with small groups would facilitate access to potential interviewees at certain times of the day and could add value to the data especially regarding the influence of other people on one's adaptation. After receiving approval from the Human Ethics Committee, small groups were also interviewed after being recruited in the same manner.

The second group of participants consisted of key informants, who were managers of establishments in the case study sites or other establishments which have taken action to adapt to the climate in the transitional city. These key informants were contacted prior to the interviews and a meeting time was arranged to carry out these interviews.

By the end of the fieldwork 86 interviews were conducted which took from ten minutes to one and a half hours to be completed. 79 participants have been recruited face-to-face in the case study sites and seven were key informants (Table 2). The participants were selected following a non-random cross-section of users from the case study sites at the time of the fieldwork.

Site	Number of interviewees		Total
	On-site recruitment	Key informants	
Cashel Mall	27	1	**28**
Rotherham Street	30	1	**31**
South Colombo Street	9	2	**11**
Windmill Centre	13	2	**15**
Smash Palace Café (extra)	0	1	**1**
Total	**79**	**7**	**86**

Table 2: Number of interviewees in each case study site

All interviewees were over 16 years old and were chosen through a varied range of ages and activities. They were all Christchurch residents or people who made Christchurch their home and have been living in the city for at least three years. This condition had two main purposes: to make sure that the respondents were familiar with the local seasonality and that they have developed an association with the place.

4.2. Microclimate measurements

The microclimate conditions we experience in a specific place may vary from the general local weather. For example, some places in Christchurch are much more popular than others according to its exposure to the sun and protection from the winds. This may seem obvious at first, if it is cold everybody looks for sunny places, but what was not so obvious was how so many locals could walk around in t-shirts when the thermometers were showing temperatures around 10°C. Coming from a different culture, that was far from the response I would expect. Before starting this research, I noticed that this particular way of responding to climate was clear in the way people using public spaces behaved, dressed and enjoyed the open areas. But what then is different in Christchurch?

Looking at the microclimatic data is easy to think that temperature, sun and wind are the most determinant variables of the local climate, and that humidity does not significantly affect the experience of comfort, as it fits into the *human comfort zone* during most of the time. But how could the sun increase the perceived temperature from the frequent -1°C and frosty mornings during the winter to a beautiful and nice winter day? And what is this 'beautiful and nice winter day' after all? There was still something unexplained.

The microclimatic measurements provided information for the investigation of meanings of comfort as the impressions and experience described by interviewees could be compared to the actual microclimate measurements.

Microclimate data collection

Based upon the argument of Westerberg et al. (2003), the microclimatic variables in each of the case study sites was measured. The microclimatic data collection used a portable weather station (La Crosse, model WS2355) placed on a tripod 1.20m from the ground, corresponding to the height of an average person when seated. The weather station panel has an internal data logger that collects data for a few hours, but connecting it to a computer (HP, model Mini 110-3500[14]) allowed direct transfer of this information to a safer device (Figure 5a). The software Heavy Weather 2.0 – which accompanied the weather station – was installed in this computer and allowed the data transfer. The collected data followed the default settings of the software and was constituted of relative pressure, indoor temperature, outdoor temperature, outdoor humidity, dewpoint, windchill, wind speed, wind direction and rain total. This data was set up to be collected every minute of fieldwork (Figure 5b).

[14] Computer specifications: Processor Intel (R) Atom (TM) CPU N550 @ 1.5GHz; Installed memory (RAM) 1.00 GB; Operational System Windows 7.

(a)

Relative Pressure	Indoor Temperature	Indoor Humidity	Outdoor Temperature	Outdoor Humidity	Dewpoint	Windchill	Wind Speed	Wind Direction	Rain Total	Time	Date
1009,5	18,4	46	20,9	39	6,4	20,9	0,0	W	0,0	11:45	17.05.2012
1009,4	18,4	46	21,1	39	6,6	21,1	0,0	NW	0,0	11:46	17.05.2012
1009,5	18,4	46	21,1	39	6,6	21,1	0,0	NW	0,0	11:47	17.05.2012
1009,4	18,4	46	21,0	39	6,5	21,0	0,0	W	0,0	11:48	17.05.2012
1009,4	18,4	46	21,0	39	6,5	21,0	0,0	W	0,0	11:49	17.05.2012
1009,3	18,4	46	21,1	39	6,6	21,1	0,0	SW	0,0	11:50	17.05.2012
1009,3	18,4	46	21,1	39	6,6	21,1	0,0	SW	0,0	11:51	17.05.2012
1009,3	18,4	46	21,1	39	6,6	21,1	0,0	SW	0,0	11:52	17.05.2012
1009,2	18,5	46	20,9	39	6,4	20,9	0,0	WSW	0,0	11:53	17.05.2012
1009,2	18,5	46	20,9	39	6,4	20,9	0,0	WSW	0,0	11:54	17.05.2012
1009,2	18,5	46	20,9	39	6,4	20,9	0,0	WNW	0,0	11:55	17.05.2012
1009,2	18,5	46	20,9	39	6,4	20,9	0,0	WNW	0,0	11:56	17.05.2012
1009,3	18,5	46	20,8	38	5,9	20,8	3,6	WNW	0,0	11:57	17.05.2012
1009,3	18,5	46	20,8	38	5,9	20,8	3,6	WNW	0,0	11:58	17.05.2012
1009,2	18,6	46	20,4	39	6,0	20,4	0,0	ENE	0,0	11:59	17.05.2012
1009,2	18,6	46	20,4	39	6,0	20,4	0,0	ENE	0,0	12:00	17.05.2012
1009,2	18,6	46	20,3	40	6,2	20,3	0,0	NW	0,0	12:01	17.05.2012
1009,2	18,6	46	20,3	40	6,2	20,3	0,0	NW	0,0	12:02	17.05.2012
1009,2	18,6	46	20,1	39	5,7	20,1	0,0	ENE	0,0	12:03	17.05.2012
1009,1	18,6	46	20,1	39	5,7	20,1	0,0	ENE	0,0	12:04	17.05.2012
1009,2	18,6	46	19,9	40	5,9	19,9	0,0	NW	0,0	12:05	17.05.2012
1009,3	18,6	46	19,9	40	5,9	19,9	0,0	NW	0,0	12:06	17.05.2012
1009,2	18,7	46	19,9	40	5,9	19,9	0,0	NW	0,0	12:07	17.05.2012

(b)

Figure 5: Weather station panel and computer used as a data logger (a), and snapshot of table with data collected by the weather station (b)

The weather station was placed as close as possible to people seated using the open areas of the cafés. Figure 6 shows the weather station placed in the four case study sites.

Figure 6: Weather station placed in the four case study sites: Rotherham Street (a); Cashel Mall (b); Windmill Centre (c); South Colombo Street (d)

Although it collected more precisely the microclimate conditions of people using the establishment areas, it also provided guidance for the evaluation of the microclimate in the extended surrounding area. The interviews carried out in the street's public benches received detailed information in the *post-interview field note* about the precise microclimate conditions. Field data was collected in the four case study sites from October 2011 to April 2013 while participant observation and in-depth interviews were carried out.

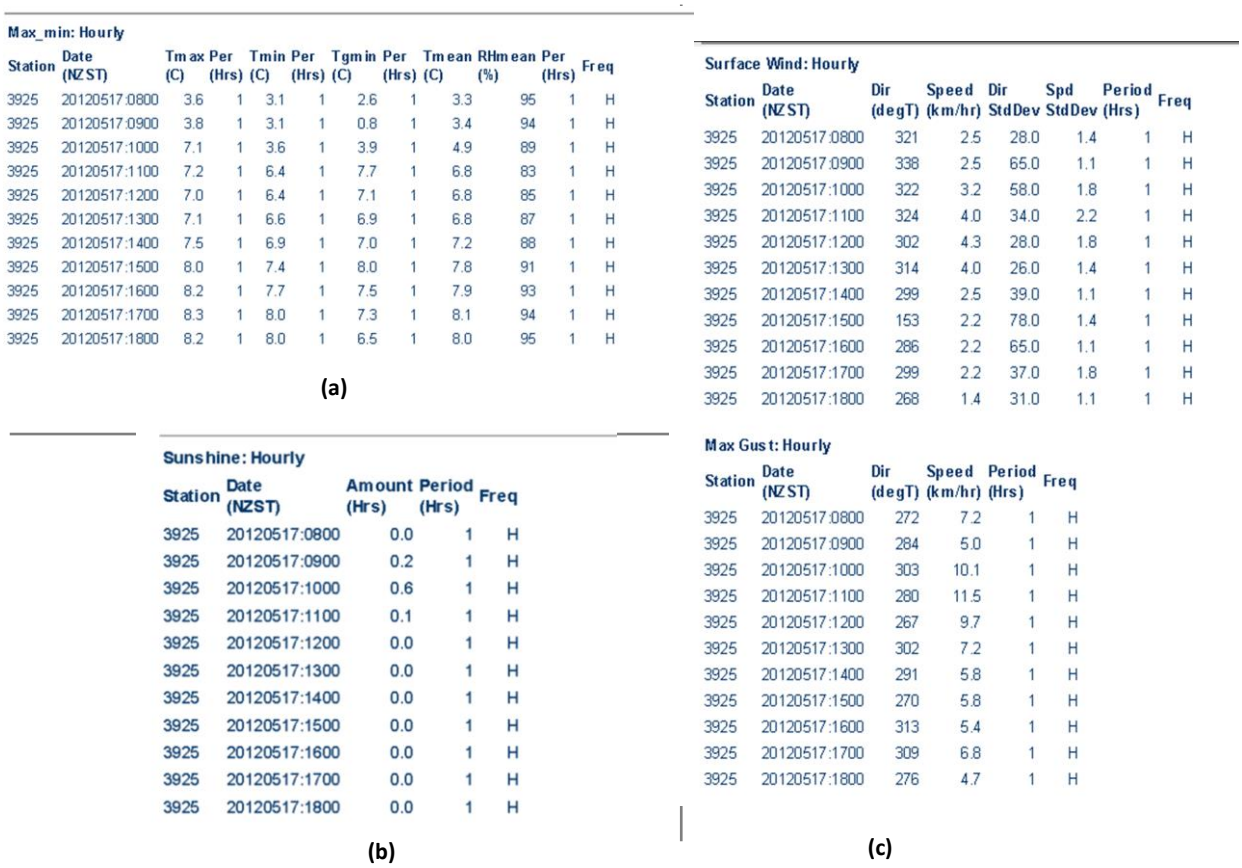
Comparisons with NIWA data

The collected microclimatic data was then compared to NIWA's Kyle Street Weather Station data[15], providing insights on the importance of urban design on resulting microclimate at the user's level. Figure 7 shows a map of Christchurch with the location of NIWA's Kyle Street Weather Station (1) and the case study sites: Rotherham Street (2); Windmill Centre (3); Cashel Mall (4) and South Colombo Street (5).

Figure 7: Location of NIWA Kyle Street Weather Station in relation to each of the case study sites (base map source: Map data ©2015 Google); and photo of the NIWA equipment of data collection (Photo: Andrew Harper)

[15] The Station at Kyle Street is a 10m tilting mast, built by NIWA made up of varying sizes of galvanised pipe sections. The base of the station is 6m above MSL (mean sea level), therefore the wind sensors are at 16m above MSL (information provided by NIWA).

Data from NIWA was acquired from the CliFlo web system[16] (NIWA, Taihoro Nukurangi, 2013b). CliFlo provides access to New Zealand's National Climate Database[17]. The data acquired was hourly downloaded and refers to the times and days of fieldwork. This data is constituted of maximum and minimum temperatures (outdoor), wind speed and direction, and hours of sunlight.



Max_min: Hourly

Station	Date (NZST)	Tmax (C)	Per (Hrs)	Tmin (C)	Per (Hrs)	Tgmin (C)	Per (Hrs)	Tmean (C)	RHmean (%)	Per (Hrs)	Freq
3925	20120517:0800	3.6	1	3.1	1	2.6	1	3.3	95	1	H
3925	20120517:0900	3.8	1	3.1	1	0.8	1	3.4	94	1	H
3925	20120517:1000	7.1	1	3.6	1	3.9	1	4.9	89	1	H
3925	20120517:1100	7.2	1	6.4	1	7.7	1	6.8	83	1	H
3925	20120517:1200	7.0	1	6.4	1	7.1	1	6.8	85	1	H
3925	20120517:1300	7.1	1	6.6	1	6.9	1	6.8	87	1	H
3925	20120517:1400	7.5	1	6.9	1	7.0	1	7.2	88	1	H
3925	20120517:1500	8.0	1	7.4	1	8.0	1	7.8	91	1	H
3925	20120517:1600	8.2	1	7.7	1	7.5	1	7.9	93	1	H
3925	20120517:1700	8.3	1	8.0	1	7.3	1	8.1	94	1	H
3925	20120517:1800	8.2	1	8.0	1	6.5	1	8.0	95	1	H

(a)

Sunshine: Hourly

Station	Date (NZST)	Amount (Hrs)	Period (Hrs)	Freq
3925	20120517:0800	0.0	1	H
3925	20120517:0900	0.2	1	H
3925	20120517:1000	0.6	1	H
3925	20120517:1100	0.1	1	H
3925	20120517:1200	0.0	1	H
3925	20120517:1300	0.0	1	H
3925	20120517:1400	0.0	1	H
3925	20120517:1500	0.0	1	H
3925	20120517:1600	0.0	1	H
3925	20120517:1700	0.0	1	H
3925	20120517:1800	0.0	1	H

(b)

Surface Wind: Hourly

Station	Date (NZST)	Dir (degT)	Speed (km/hr)	Dir StdDev	Spd StdDev	Period (Hrs)	Freq
3925	20120517:0800	321	2.5	28.0	1.4	1	H
3925	20120517:0900	338	2.5	65.0	1.1	1	H
3925	20120517:1000	322	3.2	58.0	1.8	1	H
3925	20120517:1100	324	4.0	34.0	2.2	1	H
3925	20120517:1200	302	4.3	28.0	1.8	1	H
3925	20120517:1300	314	4.0	26.0	1.4	1	H
3925	20120517:1400	299	2.5	39.0	1.1	1	H
3925	20120517:1500	153	2.2	78.0	1.4	1	H
3925	20120517:1600	286	2.2	65.0	1.1	1	H
3925	20120517:1700	299	2.2	37.0	1.8	1	H
3925	20120517:1800	268	1.4	31.0	1.1	1	H

Max Gust: Hourly

Station	Date (NZST)	Dir (degT)	Speed (km/hr)	Period (Hrs)	Freq
3925	20120517:0800	272	7.2	1	H
3925	20120517:0900	284	5.0	1	H
3925	20120517:1000	303	10.1	1	H
3925	20120517:1100	280	11.5	1	H
3925	20120517:1200	267	9.7	1	H
3925	20120517:1300	302	7.2	1	H
3925	20120517:1400	291	5.8	1	H
3925	20120517:1500	270	5.8	1	H
3925	20120517:1600	313	5.4	1	H
3925	20120517:1700	309	6.8	1	H
3925	20120517:1800	276	4.7	1	H

(c)

Figure 8: Snapshots of data acquired from NIWA's CliFlo: maximum and minimum temperatures (a); sunshine (b); and wind speed, direction and maximum gust (c).

The minute-by-minute data collected in the cases study sites was then summarized to be compared with data from NIWA. This approach to microclimate added a means of comparing people's observed and described weather experience with the measured local data. Moreover, it allowed a comparison between the general microclimate measured by NIWA's weather station and the local microclimate on the sites, consequent of the space design. Consistencies and inconsistencies between data measured by NIWA and data measured in the case study sites are discussed in more detail in Chapter Five.

[16] There were two days of fieldwork (21 March and 27 March 2012) where NIWA did not have available the temperature data from Kyle Street weather station to be compared to the one measured on the sites. In those two days the temperature data was acquired from NIWA's Airport weather station, also downloaded from CliFlo. This data can present some variation to the Kyle Street one as the surroundings of the areas where the weather stations are located are different.

[17] This database holds data from around 6500 climate stations which have been operating for various periods since 1850. Data continues to be received from over 600 stations currently operating (NIWA, Taihoro Nukurangi, 2013b).

4.3. Intervention: Blankets in a café

In addition to the methods previously described, I wanted to investigate local people's adaptation strategies to the local microclimate. The intention at the outset was to change some of the microclimatic characteristics of a case study site through the addition of windbreaks, vegetation, change configuration and so forth. However, it soon became clear that it was not appropriate to do so because of the instability and changing nature of the post-disaster environment. The city was already disrupted and the landscape was very new to everyone, thus it did not seem appropriate to impose more changes especially in the established sites which remained open after the disaster. Furthermore, considering the uncertainty of the surroundings the emerging settings and their temporary enterprises, adding unnecessary changes did not seem the best way of contributing to a healthy urban environment.

For that reason the design experiment was downscaled to an intervention in an outdoor area of a café. The intervention was carried out during the winter of 2012. The experiment was based upon the differences between indoor and outdoor temperature and the intention of providing ways of adapting to the outdoor environment. The intervention was based upon the placement of blankets in the open area of a café. These blankets were placed early in the morning and collected at the end of the fieldwork day. Their colour was intentionally bright, so they could attract passers-by attention (Figure 9).

Figure 9: Blankets in the café

The intervention provided rich data especially on stimulating interaction between space users. It provided valuable insights in respect to how some people might act in a certain way because they are in the company of friends. These results are discussed in Chapter Six.

4.4. Data management and analysis

The interviews were recorded and transcribed and have been qualitatively analysed using the process of coding and memoing (Lofland et al., 2006) without the use of any software. I transcribed

the interviews in groups – first the 17 pilot interviews and then in three groups of similar numbers – each group informed the next round of interviews. After printing, the transcriptions were coded manually, and then the identified codes were added to the corresponding interviews' number in a spreadsheet. After the first group of interviews was coded some main topics started to emerge and then colours were assigned to them. The subsequent analysis reinforced the main themes and some important sub-themes. The relationship between these codes and the differences between them was described in a table through the process of memoing.

Each day of fieldwork had also its own microclimatic data files. These files counted on the data measured with the weather station on-site, NIWA's weather station data for that specific day, and some snapshots taken from the MetService iPhone application throughout the fieldwork day.

In summary every day in the field followed the following basic routine:

1. Placing the weather station;
2. Connecting the computer (the data logger) and checking the data transfer between the weather station and the computer;
3. Placing the computer in a safe place inside the café;
4. Focused participant observation for around one hour;
5. Interviews and participant observation – the time in-between interviews was constantly described on the research journal;
6. Full fieldnotes by the end of the day.

The multi-method design of this research generated some challenges and potential limitations. These matters are acknowledged in the following section.

5. METHODOLOGICAL CHALLENGES AND LIMITATIONS

Christchurch posed significant challenges especially related to the nature of the post-earthquake environment and in particular the constant aftershocks during the fieldwork period (Figure 10), demolitions, reconstructions and relocations.

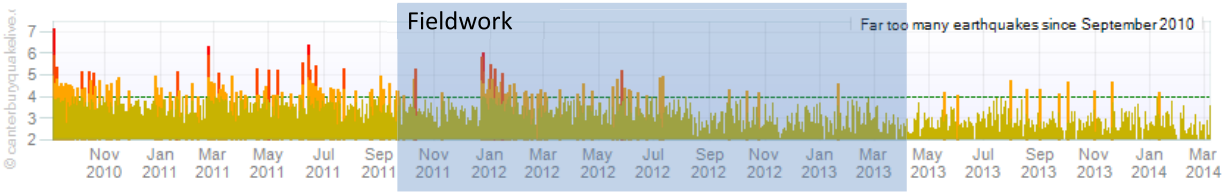


Figure 10: Aftershocks since September 2010 and during the fieldwork period

It was clear by the end of the fieldwork that research into urban design in face of instability requires a robust and flexible research approach. In the scope of the adopted methodology some challenges and limitations can be highlighted and are described next.

5.1. Challenges of the method

The methods adopted presented some challenges regarding the post-earthquake environment and its changes, recruitment of participants, and the weather station placement and security.

The changing nature of the post-earthquake landscape

At the pilot study stage of the research, not many sites were accessible around the city. As a consequence the pilot study was carried out in two established settings in Christchurch and one in Rangiora, a neighbour town which has a central street with similar characteristics to some of Christchurch's Central City streets. As there was an intense dynamics around the city regarding urban repairs, everyone was trying to avoid as much as possible further disruption – probably including researchers in the site. This made it difficult to get permission to work in some sites.

Still during the pilot study period, the emerging settings were slowly taking shape around the city and there was no guarantee of how long they would remain in place. Figure 11 depicts the changing nature of the emerging settings over the course of the fieldwork.

Figure 11: Example of landscape changes in the emerging case study sites during the fieldwork and until present – Cashel Mall on the top and South Colombo Street on the bottom

Some of the established settings that had been considered as case study sites had to be closed for post-earthquake repairs, proving that not much was really established at the time of the fieldwork. Some case study sites that were being considered became unavailable overnight. Furthermore, the emerging sites became tourist attractions in the warmer seasons, making it more difficult to interview locals. The adoption of an adaptive methodology allowed this dynamic landscape to be captured in this investigation, at the same time that it clarified how the rapidly changing environment influences adaptive capacity.

Recruitment challenges

A face-to-face participant recruitment strategy was adopted. Because of the nature of this process and the confidentiality requirements there was a need for balance in the number of people in the setting. The settings needed enough people to have potential interviewees but not too many that would compromise privacy. In some case study sites the customers proved to be loyal to the establishments and came back many times after being interviewed. This also made awkward the recruitment of other interviewees when they were using adjacent tables to the previously interviewed customers. All these factors made interviewee recruitment difficult at some specific times of the day – especially at lunch time. For that reason and for understanding that interaction was a powerful component of adaptation to the climate, small group interviews were added to the research strategy.

Some types of people, depending on their activity and age were more or less easy to talk to. Business people, for example, tended to have less time and so were harder to interview. This happened across all the sites in different times of the day according to its predominant public.

Weather station

The communication between the weather station and the data logger was at times temperamental because of the buildings' materials. In one of the emerging urban settings the steel of the containers hosting the stores influenced the wireless connection between the devices. I then decided to change and place the weather station and the data logger computer in a different place, however with no prior notice the store which was hosting the data logger computer shifted to a different area of the site, becoming unavailable for the purpose of this research. A third option had to be chosen.

In the other emerging site, because the café was located in a trailer and that was the only energy supply in the site, I did not have easy access to the computer once all the equipment was placed and collecting data. Furthermore, there were risks of placing the equipment in kitchens and trailers hosting cafés, because of the presence of liquids and food.

A third issue related to the weather station was security. In the *landscape-defined streets* the research area was restricted and easier to manage. However, in the *building-defined streets* I have not concentrated in one single space, but rather have been walking along the street. This was challenging as the weather station was placed in a specific place sometimes far away from the place where I was conducting an interview. This was particularly challenging during school holidays.

Integrative methods

The last challenge regarded the integration between the qualitative and the quantitative data. The numbers related to microclimate measures were necessary to allow the interpretation of what interviewees mean by nice, pleasant, windy, hot, cold and so forth. It was necessary to know the real microclimate, measured on the site, to which participants were responding to. Despite this need, the work is aimed at exploring meanings that shape urban comfort locally, instead of quantifiable aspects of the phenomena. To fulfil the research needs, the data was analysed and broadly categorised according to its similarities and differences from the data measured by NIWA. This approach also showed the influence of design decisions on the resulting microclimate. Design solutions proved to significantly change the resulting microclimate in Christchurch.

5.2. Limitations of the method

Nature of the case study sites

The early days of fieldwork in each site were mainly based upon participant observation. The time spent in the field was dependent on the activity in each site, and the opening hours of the cafés limited the time in the field. Workers and people who are unavailable at those times of the day when the fieldwork was carried out or who live and/or work in different areas from those where the case study sites were located, did not have a chance of being interviewed. This was reflected in the age group and lifestyle of participants.

Depending on the nature of the case study sites – in this case regarding their urban form – the number of interviewees varied. This did not compromise the data because the activity in some sites is more localised, happening in a restricted area, and therefore easier to be explored.

Time of the year and seasons

Because of the changing character of the city and the fluid way the sites were being closed or created, it was not possible to carry out the fieldwork in one of the emerging sites (South Colombo Street) during all the seasons. This is also the reason why there was a smaller number of interviews in

this site. However, the results were satisfactory as the characteristics of the local climate allowed the fieldwork to be carried out in different types of day under a variety of conditions.

6. ETHICAL CONCERNS

This research respected the ethical practices and has been approved by the Lincoln University Human Ethics Committee (HEC) (Appendix 1). Throughout the fieldwork and data analysis it has maintained the proposed methods, interviewees' recruitment, confidentiality and data security procedures, and consent and information practices. The first HEC application was aimed for interviews with individuals. Based on the dynamics of the fieldwork an amendment was made later with the intention of getting approval to interview small groups. Both applications were approved.

Access to the establishments located in the case study sites – where the weather station was placed – was achieved through negotiation with the owners and/or managers of each café, shopping mall and commercial centre. This agreement was reached after the HEC approval and prior to the pilot study. At the time of the interviews, respondents were fully informed about the purpose of their participation – both verbally and through a written information sheet (see Appendix 4). All participants have signed a consent form (see Appendix 5) and were assigned a number which connected them to the interview transcripts. Consent form and numbers were kept locked at Lincoln University separated from the interview transcripts. As confidentiality was important in this research, any information that could identify participants in the written document has been excluded in order to ensure anonymity.

7. SUMMARY

Moving beyond conventional techniques into the realms of interpretive social science approaches this research integrated a variety of methods which enabled the capture of diverse data and revealed rich insights. In this chapter the methodological approach adopted which, by necessity, had to be adaptive, was described. The interpretive strategy, the multi-method research design and the research methods – including data collection and analysis was presented. The research involved a detailed exploration of a complex socio-cultural phenomenon where the case study sites served as microcosms of a larger scale phenomenon. The next chapter introduces the characteristics of each case study site.

CHAPTER FOUR: A Christchurch case study

The surrounding physical landscape has a significant influence on local culture and lifestyle (Bell, 1996; Bell & Matthewman, 2004; Hough, 1990, 2002b). Christchurch is presented in this chapter with regard to the city's history, geography, climate and cultural identity. My main research question is focused on how Christchurch residents experience and adapt to climate in urban environments and the way they use public open spaces in the post-earthquake environment – factors that influence urban comfort. To make sense of urban comfort as it is expressed in Christchurch, the fieldwork was carried out in several public open spaces within or close to Christchurch CBD. The last part of this chapter explores the case study sites and the area of the city where they are located. A brief contextual history, their pre- and post-earthquake condition, and their spatial and microclimatic characteristics are also considered.

1. HISTORY

The settlement of Christchurch was planned in England in the mid-19th Century by lawyer John Robert Godley and colonisation theorist Edward Gibbon Wakefield. Together they formed the Canterbury Association in conjunction with Anglican clergy, including the Archbishop of Canterbury, and other members of the English elite, and the colonial settlement of Christchurch was founded in 1850 (McBride, 1999; J. Wilson, 2005).

Christchurch became the administrative and commercial capital of Canterbury Province and the central city became Christchurch's heart after the completion of the sewage and stormwater systems in the early 1880s. Another factor that transformed the life of the central city was the public supply of electricity. It began in 1903 and the first electric trams started running in 1905, reaching their maximum extent in 1914. The new transport system simultaneously increased suburban growth and reinforced the central city life as the routes would meet in the Cathedral Square. The focus of the city centre were shops, entertainment and work, and between the 1920s and the 1960s most of the city's cinemas were around the Cathedral Square. This reality started to change in the second half of the 20th century, when there was an increased use of private cars transforming the role of the Central City. New shopping malls in the periphery started to be built and the population of the central city decreased, and it began to lose its role as the city's most popular meeting place. Key projects were aimed at enhancing the Central City in the early 21st century, including a new Art Gallery, the Convention Centre, the renovation of Worcester Boulevard, Cathedral Square and Cashel Mall (Christchurch City Council, 2011a). However, its commercial decline continued.

With all its Englishness, the strongest image of the Christchurch is that of the *Garden City*. Christchurch was first described by Sir John Gorst as the Garden City when he re-visited the country at the 1906-07 International Exhibition (Christchurch City Council, 2011a; J. Wilson, 2005). The Exhibition happened at the time of the British Garden City Movement and it has been said that Gorst identified all the principles being advocated in Britain. However, the reasons why Christchurch has been known for so long as the Garden City have since become dissociated from Gorst's initial vision:

> Christchurch soon lost the architectural and town-planning overtones of the British [Garden City] concept and was understood to refer to the presence in Christchurch of extensive public and numerous private gardens. It is sometimes unclear whether Christchurch's later reputation as a 'garden city' derives from the fine planting and maintenance of public open spaces of the central city or from the efforts made by those Christchurch citizens who assiduously tend flower-filled front gardens. (J. Wilson, 2005, p. 107)

The social ideology sought through the settlement of Christchurch was the reverse of the disrupted society of Britain in the 18th and 19th centuries (Christchurch City Council, 2011a; McBride, 1999). The new immigrants developed in New Zealand a lifestyle that A. Mitchell (1972) calls the *quarter-acre pavlova paradise* in which families could live in detached bungalow style houses with substantial gardens. These large sections fostered a strong tradition of home gardening in Christchurch.

> If all else failed, there was always the garden to tend. These two decades [1920's and 1930's] were a golden age for the Canterbury Horticultural Society (…). The society gave inspiration and encouragement to thousands of home gardeners, reinforcing Christchurch's image as the 'Garden City'. Its journal (…) was entitled 'The City Beautiful'. (Rice, Sharfe, & Christchurch History Project, 1999, pp. 104-106)

The Garden City image has been reinforced by organisations such as the Christchurch Beautifying Association and Horticultural Society, which have since 1890 been running competitions for the best home gardens (J. Wilson, 2005). This puts home gardeners in the suburbs in a central position as contributors to the city's identity.

This investigation is based upon case studies within Christchurch where the local climate seems to have influenced the way gardens are treated. The site chosen for Christchurch has a good climate but is very exposed to winds. This characteristic, associated with the flatness of the city location has affected patterns of development in Christchurch and strengthened a tendency to protect homes with plantings and fences (J. Wilson, 2005).

2. GEOGRAPHY

Christchurch is located on the Canterbury Plains and is the largest city of the South Island with an area of 1,426 km² (Rosenberg, 2011). It has the second largest population of the country, behind Auckland. Before the earthquakes the population of Christchurch was 376,700 inhabitants and after the earthquakes it declined by 13,500 persons. However, according to the 2013 Census the city now has 341,469 residents a total decline of 35,000 persons. In the same period there has been growth in Selwyn and Waimakariri, districts adjacent to Christchurch (Statistics New Zealand, 2013a).

The Canterbury Plains are a large post glacial alluvial plain to the east of the Southern Alps on the east coast of the South Island. The city of Christchurch is located on a low lying coastal margin, where the plains meet the ancient volcanic rocks of Banks Peninsula[18]. It is built on land of very recent formation, which was once predominantly a swamp, situated behind sand dunes, estuaries and lagoons. The gravel, sand and silts of rivers and overbank flood deposits of the Waimakariri River form the dominant soils. Sand dunes and old dune ridges occur throughout the eastern city towards the coast (Christchurch City Council, 2003). The city is bounded to the east by the Pacific Ocean and the estuary of Avon and Heathcote Rivers. The western limit is Selwyn District, the northern limit is the braided Waimakariri River and the southern limit is defined by the volcanic slopes of the Port Hills separating it from Banks Peninsula. According to J. Wilson (2005, p. 9), Christchurch has three dominant landscape elements deriving from its geological evolution:

> The flatness of the plain; the moderating of the sense of expanse by the volcanic Port Hills to the south; and the distant relief to the west of the outlying ('foothill') ranges of the Southern Alps, which are snow-covered in winter.

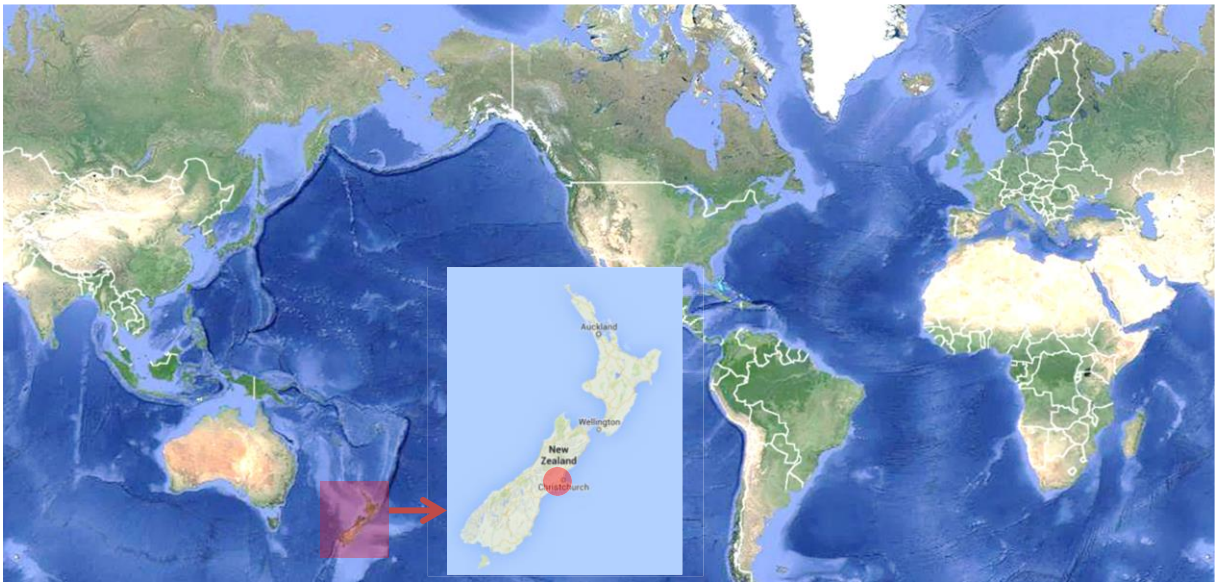


Figure 12: Location of Christchurch (base map source: Map data ©2013 Google)

[18] Banks Peninsula was incorporated in the Christchurch City Council in 2006 (New Zealand Government, 2011)

Christchurch is located far from major active fault lines – the Alpine fault is well to the west and the other North Canterbury faults well to the north (J. Wilson, 2005). However, the earthquakes since September 2010 have been located on previously unknown active faults (Christchurch City Council, 2011a). Geological hazards to which Christchurch is exposed to include earthquakes and related effects such as liquefaction and ground rupture; erosion, flooding and sedimentation; slope instability in hill and mountain terrain; and risk from tsunami and sea-level rise in low-lying areas along the coast (Forsyth, Barrell, & Jongens, 2008, p. v). Geomorphology and soils are the physical foundation for the built environment, and influence the character of the urban landscape. As in any city, the urban uses in Christchurch area have largely impacted on the original characteristics of the land and since its establishment in the 1850's the original landscape has been affected by drainage, shifting of waterways, infilling of hollows, and construction of infrastructure and buildings (Christchurch City Council, 2003).

The local soil of the Canterbury Plains is constituted by complex inter-layered formations deposited by eastward-flowing rivers from the Southern Alps towards the Pacific coast. The top 20-25m of the central city soil is formed by recent alluvial soils and is highly variable within relatively short distances. These characteristics make the central city soil susceptible to liquefaction (Cubrinovski & McCahon, 2011). The process of liquefaction could affect any area near a river, estuary or coastline, and in Christchurch the worst-affected areas in the 2010-2011 earthquakes were coastal suburbs – such as New Brighton – and areas close to the Avon and Heathcote Rivers (Davidson, 2010). The liquefaction-prone soil makes the construction of earthquake-resistant buildings complex and challenging in these areas (Heather, 2011). Liquefaction is a process which temporarily turns firm ground into liquid:

> Over thousands of years rivers deposit layers of silt and sand in many places, especially in low-lying ground and near the coast. The top layer of sediment can become flat, firm and dry – ideal for building on – but this often hides layers of waterlogged sediment beneath. (…) Liquefaction only happens when underlying waterlogged silts are present and when shaking is severe. When the ground becomes liquid, it can no longer support the weight of buildings (…) During the 2010 and 2011 Canterbury earthquakes, over 400,000 tonnes of silt came to the surface, covering streets and gardens in several suburbs. (The University of Waikato, 2012)

Another factor contributing to the substantial liquefaction in the central city was the high water table and underground aquifers and streams. In the western suburbs – the least damaged ones – the water table is around 5m deep and it becomes shallower towards the east until it approaches the surface in the coastline (Cubrinovski & McCahon, 2011).

The liquefaction in large areas of the central city affected the integrity of many multi-story buildings due to lateral movement of foundations and structural failures. The liquefaction zone “consists

mostly of sandy soils and it largely coincides with the path of the Avon River and the network of old streams" (Cubrinovski & McCahon, 2011, p. 16). The soil conditions within the central city are therefore complex and challenging particularly regarding the performance of buildings during strong earthquakes. The CTV and the Pyne Gould Building, the buildings that claimed the largest number of lives in the February earthquake, occupied areas of very soft soil where the ground susceptibility to liquefaction is very high (Booker, 2011).

The geography of Christchurch affects my research in three ways. First, the dominant landscape elements pointed out by J. Wilson (2005) provide the physical characteristics that promote outdoor culture. Second, the tectonics, type of soil and proximity to fault lines caused the changes in the city and provided an unstable ground for the development of this study. Finally, the latitude combined with the surrounding landscape (especially the presence of the ocean and the mountains) influence the local climate.

3. CLIMATE

New Zealand's South Island is located in a temperate climate zone between 35°S (in Kaitaia) and around 46°S (in Invercargill). As a small land mass surrounded by oceans, New Zealand's temperate climate is also a maritime one (Mullan, Tait, & Thompson, 2012). Maritime climates – also known as oceanic climates or marine climates – occur in regions where the climatic characteristics are conditioned by their proximity to a sea or an ocean (Oliver, 2014). The ocean plays a key role in New Zealand's climate as there are no major land masses between the South Island and Antarctica, and the climate is strongly influenced by general circulation patterns in the Southwest Pacific (Huisman, 2014). In summary, the three key factors determining New Zealand's climate are the prevailing winds, the surrounding oceans, and the country's mountain ranges. New Zealand is affected by strong winds coming from the west which when passing across or south of the country bring rain and stormy weather. When these winds reach the barrier of the mountains they rise, causing rain on the west coasts especially in the South Island (Mullan et al., 2012).

In Christchurch, however, the climate patterns are different. The Southern Alps are a barrier to the westerly winds and the city has a relatively low mean annual rainfall, although humid easterly winds can give rise to significant rainfall in Christchurch at times (McGann, 1992). The predominance of east/northeast winds is also a consequence of the combination of differential heating of the Canterbury Plains and the ocean. The differential heating happens because the plains heat faster than the ocean, causing air flow from the ocean to the land as the rising heated air pulls the cooler air into the vacant space. This phenomenon is more common during the summer.

According to Köeppen-Geiger climate classification, New Zealand has a Cfb Climate, which is a temperate climate without dry season and with a warm summer (Garr & Fitzharris, 1991; Peel, Finlayson, & McMahon, 2007). The mean annual temperatures in the country range from 10°C in the south to 16°C in the north with the coldest month being usually July, and the warmest being January or February and most of New Zealand has at least 1,800 hours annually (Mullan et al., 2012).

Christchurch has summer mean daily maximum air temperatures ranging from 20°C to 22.5°C, but may reach more than 30°C. Winters are cold with frequent morning frost – related to calm wind conditions and often followed by glorious and sunny winter days – and winter mean daily maximum air temperatures range from 11°C to 14°C. The average relative humidity in Christchurch varies from a minimum of 71.5% in December to a maximum of 87.3% in July (NIWA, Taihoro Nukurangi 2013). This data show that high levels of humidity are not a local problem. Solar radiation and the prevailing winds are the most important microclimatic variables, and low levels of humidity can cause uncomfortable conditions. The local climate perception is strongly dependent on the wind patterns. Cool northeasterly winds from the sea are common for much of the year. Hot dry northwesterlies are possible at any time of the year, and during summer the highest temperatures are registered when this föhn[19] wind blows. Despite blowing only around 3% of the time (McGann, 1992), northwesterlies are an important factor of Christchurch climate as they can raise the temperature by 10-15°C within about an hour. High temperatures with very low relative humidity can occur, and are associated with strong northwesterly winds, which give the highest temperatures in all seasons. The 'northwest arch' is also associated with northwesterlies, they are "a band of high clouds forms over the plains with clear sky visible between the tops of the mountains and the cloud sheet" (McGann, 1992, p. 9). Cold southwesterlies are more frequent during winter, tend to bring rain and reduce air and radiant temperature, affecting thermal sensation. Southerlies are uncommon in Christchurch due to the protection provided by the Banks Peninsula (ENZ, 2013).

Another important variable of the local climate is the sun. In New Zealand the sun tends to be very strong because there is less ozone to block the UV rays, the Earth's orbit takes it closer to the sun during the southern summer than during the northern summer, and there is less pollution over the southern hemisphere. Because of its location (43.3° South) and for being located on an island in the Pacific Ocean, Christchurch is cooler during the summer months than cities with the same latitude in the northern hemisphere (ENZ, 2013).

The discussions and weather descriptions in Christchurch tend to gravitate around the winds. In general it is more informative to focus on wind patterns than on *typical days* representative of winter

[19] A föhn wind is a type of dry and warm wind which usually occurs in the down-slope side of a mountain range. The norwester is a fohn type wind from the Southern Alps (ENZ, 2013).

or summer. This is because the patterns of wind can make a summer day cold, or a winter day warm. Therefore there are a few distinct types of days – which are in some cases more common in certain seasons, but not restricted to them:

- The warm or hot norwesterly days
- The cool or cold overcast easterly days
- The cold overcast southwesterly days
- The usually pleasant still days

In summary, considering the temperature and wind patterns in Christchurch, the most important variables to be taken into account when designing for microclimate are wind and sun. The microclimate can be largely variable throughout the city and it can be modified through design solutions (see detailed discussion about the case study sites in Chapter Five). These design solutions will influence the city's microclimate consequently impacting on people's choice for walking and shopping, as identified in the Central City Plan (Christchurch City Council, 2011b, p. 446).

> Given prevailing wind conditions and solar access, generally the poorer streets for retail in the city are those that run east/west when they are dominated by tall buildings. Hereford Street has a poor microclimate for retail as do Armagh and Worcester Streets between Colombo and Manchester Streets. Cashel Mall however has low buildings on the north side which reduces the influence of the easterly wind effect and the overshadowing of the street.

People walking on the streets are an important factor for increased business and strong economy. The urban form – and urban comfort – has a critical role on this aspect of the urban life as the microclimate and urban qualities – such as block size, structure, pedestrian cover and so forth are critical on the decision and choice for walking or even being in the city.

4. CULTURE AND LIFESTYLE

New Zealand's landscape is nationally and internationally recognised as one of the nation's defining characteristics (Wray, 2009), and for that reason meanings attached to landscapes are strongly expressed. The natural landscape in particular provides important connections to a proud pioneering heritage and enjoying the outdoor life is "a way of taking part in a long-held, and high valued tradition of escaping to, exploring and connecting with wild New Zealand nature and the New Zealand Landscape" (Wray, 2011, p. 92).

Attachment and access to the natural landscape partially defines the *type of life* New Zealanders expect when they inhabit an urban environment, and local lifestyles are therefore closely connected to the natural landscapes, and outdoor sports and recreation, as Bell (1996, p. 36) describes:

> National identity based on physical geography, and on idealisation of lifestyles within nature, is persistently used as our claim to fame. We are far less notable for what we have in terms of everyday cultural creations that we have ourselves made, such as intellectual property, service, or glamorous or interesting towns. Most New Zealanders live in cities, well away from the sublime landscape. We know these cities are much like those of everywhere else while our nature isn't. Nature persists in the imagery that shows our difference, and is a reality that can be affirmed by a short drive out of town, reinforcing the aptness of these representations over those of city life.

New Zealand was practically independent from England since the late 19th Century, but when the new nation became officially independent in 1947, the natural landscape was the basis of an emerging self-identity in several ways:

> First, it distinguished New Zealand from England by providing a unique natural habitat for species that were found nowhere else in the world. Second, the wilderness landscapes enabled New Zealanders to showcase their outstanding natural heritage (in contrast to the cultural/built heritage of England). Third, wilderness embodied the pioneering ethic of adventure and exploration, which helped to define New Zealand settler society and to distinguish it from Europe. And finally, wilderness symbolized two of the fundamental values of early New Zealand society that were believed to be lacking in England: freedom and egalitarianism. (Wray, 2011, p. 88)

Bell has described how New Zealanders become familiar with their landscape – including climate. New Zealand nature is particularly understood as part of *home* (Bell, 1996). In this sense the author also points out how the meaning of where one belongs to is most frequently related to the natural landscape, even if the person lives in the city.

> 'Where are you from?' – this often asked question of one New Zealander to another conveys in the reply some of these natural features, and the supposed way of life likely to go with them such as farming on the Southland Plains, winter sports on the Central Plateau, the beach environment of the Bay of Islands, and so on. Investigation of our collective appreciation of nature helps us to understand its role in national identity formulation and patriotism. (Bell, 1996, pp. 28-29)

This sense of belonging is strongly present in the indigenous Maori culture which has a deep connection with the landscape. It is represented in many ways including meanings attached to rivers, oceans, wind, thunder, lighting, the scenery in general and so forth.

> Anything that makes Maori people 'Maori' in terms of their tūrangawaewae[20] and tangata whenua[21] status can be seen as evidence of the rightness (tikanga) of belonging to a place, within a framework of traditional markers of identity such as a

[20] "Tūrangawaewae is one of the most well-known and powerful Māori concepts. Literally tūranga (standing place), waewae (feet), it is often translated as 'a place to stand'. Tūrangawaewae are places where we feel especially empowered and connected. They are our foundation, our place in the world, our home." (Te Ahukaramū Charles Royal, 2012)

[21] Local indigenous people (*tangata* means 'people' and *whenua* means *land*).

> significant mountain or hill, lake or river, and other outstanding natural features. This feeling of rightness and belonging includes respect for and association with the ancestors, with ancestral homelands and history, and with kin groups that trace their descent lines back to those homelands and ancestors. (A. Smith, 2010, p. 37)

This strong relationship of the indigenous people with their landscapes has perhaps influenced the post-European culture. A. Smith (2010) has argued for deeper investigations regarding *if* and *how* the Maori identification and feelings for places in the local landscape are shared by other ethnical groups living in New Zealand. What can be said about Pakeha identification with the landscape, and with Pakeha indigeneity in general, for example?

Socio-cultural values related to nature and landscape in New Zealand are intrinsic to the local culture and influence urbanity. This might influence what New Zealanders like, the preferred city environment and the expectations related to the quality of life. The provision of liveability will then determine how 'good' the city is from the perspective of the specific culture. In the scope of the present research, the aforementioned meanings and cultural perspectives influence the expectations towards the urban life. The expectation towards the daily urban life and its environment carries the background of socio-cultural aspects of the outdoor experience. Christchurch has a privileged location allowing its residents and visitors to enjoy activities based upon beach environments and snowy mountains within a short distance.

> There is nowhere else in the world where within two hours of an international airport you can ski at a world class alpine resort, play golf, bungy jump, go rafting, mountain biking, hot-air ballooning, wind surfing, whale watching and visit world class wineries and gardens. (Christchurch City Council, 2013)

Powerful symbols of nature attract tourists and mountaineers from different parts of the world. At the same time, they are important elements of cultural identities providing sense of place through the feelings and emotions they evoke (Cresswell, 2009). Roncoli et al. (2009) have also noted that perceptions of landscape can vary according to the respondents' birthplace, residence, experience, and worldview. They found out that locally born people emphasised utilitarian aspects of the landscape while those who moved in were more aware of the aesthetic and spiritual meanings of it.

Another interesting aspect of the outdoor experience and lifestyle is the proud tradition of living close to nature – clean and green New Zealand (Shillington, 2013). This interface with nature in traditional New Zealand dwellings is referred to as the *quarter-acre dream* by Mitchell (1972). This typology of housing does influence the aesthetics of the city both regarding density and greenery, but most importantly here, regarding the propositions of this research, it shortens distances between inside and out and promotes the immediate contact with nature through backyards. This aspect of the daily life is also investigated regarding experience and adaptation to climate.

Building typologies also influence the urban microclimate and people's experience of the climate. Most cities in New Zealand do not have problems related to heat islands. Apart from Auckland, the country's largest city, other cities are not large or populated enough to have problems related to pollution or heating islands and there is limited scholarly attention to urban microclimate. Most research done in New Zealand and relevant to the scope of my research is focused on sustainable cities (Boothroyd & Drury, 2007); biodiversity, ecology and urban landscape (Baines, 2003; Kilvington & Allen, 2003; Simovic & Fenwick, 2003; Swaffield, 2003; J. M. Williams, 2003); private landscapes (Brakey, 2003); mesoclimate and sustainable land management (N. Mitchell, Espie, & Hankin, 2004); rural and untouched landscapes (Given, 2003) and wind farms (Barry & Chapman, 2009). Of special importance is the work by Walton et al. (2007). This work is applied to Wellington (New Zealand) and presents a model of the influence and effects of climatic variables on peoples' comfort in outdoor urban areas. The investigation adopts both questionnaire and observation, exploring adaptation through objective measures. There is still a need to understand the relationship between the climate and the local culture in a way to inform the design of urban landscapes.

4.1. City life

The Central City Plan and the proposed blueprint for the central city (Canterbury Earthquake Recovery Authority, 2012) focus on the central city's business, entertainment and housing following the earthquakes. The rebuild and revitalisation of the central city has to offer a great experience regarding "built form, streetscape, art and culture, micro-climate or in more general terms the experience of the city" (Christchurch City Council, 2011b, p. 443). Although there are dimensions of the city that are affected by globalisation, the quality of this *experience* is dependent on the local culture and identity, and therefore influenced by urban comfort.

Christchurch's urban identity is strongly influenced by the surrounding physical landscape. The central city is unique regarding its elements and features such as the combination of street grids and rivers with an astonishing view from the inner city offices of rural areas or the Alps. Christchurch also has an international airport within a ten minute scenic drive from the central city, the presence of trout in a river flowing through the middle of city and even the fact that snow fed tap water from the nearby Alps is clean and needs no treatment adds to the city's identity (Craig, Doeksen, Lake, & Unit, 1993).

> Many cities have similar features to Christchurch such as meandering rivers, parks, squares, boulevards and beyond the inner city, hills, coast and a harbour for example. What makes Christchurch different from other cities is clearly not these features alone but rather the way they are combined and related to each other. (Craig et al., 1993, p. 36)

Christchurch Central City is also compact, meaning it is easy to move from one place to another, as a pedestrian. Ancell and Thompson-Fawcett (2008) have noticed a change in people's travel modes when they moved to live in the central city and attribute the change to choice of transport options, good pedestrian linkages and thoroughfares, cycle lanes and bus services. The central city has also gone through a number of renovations – including the Worcester Boulevard and the Cathedral Square in the late 1990's – which influenced the uses of its open spaces, its self-image as an 'English city' and its urbanity.

> This has involved the building of pedestrian malls and river sites, with street side cafes, niche boutiques and other supporting attractions. The redevelopment of the Square is the latest in a series of inner-city enhancement projects following the Arts Centre, Victoria Square (1988-89), Worcester Boulevard (1992-3), Cashel and High Street malls (1993-4), a tram (1993-6), and Oxford Terrace (1996-8). The invented and selected history – reflecting the city myths of Christchurch as the 'English city' – is expressed by cobbled paved malls, a 'historic' tram, a boulevard, 'archaic' light stands, selective preservation of old buildings, complemented by horse drawn carriages and a town crier employed by the City Council. (McBride, 1999, p. 6)

The Cathedral Square is probably the most well-known landmark of Christchurch and is considered the *city heart* (McBride, 1999; Temple, 1987). Its redevelopment in the decades before the earthquakes reflects a shift in the central city in which participation in public spaces became more and more based on the ability to consume. The dominance of tourists and tourist facilities and the exodus of state and local services, communicates a the message that the city is less willing to accommodate all its citizens in his central site (McBride, 1999). A similar phenomenon has happened with the housing units located in the central city. The area has undergone intensification over the past two decades before the earthquakes. Ancell and Thompson-Fawcett (2008, p. 433) have pointed out a "classic situation of gentrification and displacement [which] was taking place as some low-income groups were being priced out of the central city". This happened because the property and rentals prices were high and therefore the central city was frequently seen as a place for short term living. This situation has caused an increase on the number of immigrants in the area, while local residents started to shift to the suburbs. Other issues such as poor construction, need of more facilities such as supermarkets and green spaces, noise and safety are common issues affecting the dwellers of the central city culminating to a conclusion that "the current provision of medium density housing in the city is far from socially sustainable. A range of alternative mechanisms is needed to better facilitate a favourable transformation" (Ancell & Thompson-Fawcett, 2008, p. 438).

It has also been suggested that while other cities disperse, "the spreading hectares of Christchurch suburbia are still tied to the lines of commerce and culture that spring from the city's planned and historical centre" (Temple, 1987, p. 52). However, despite all the efforts to promote medium-density living in the central city, before the earthquakes the area had only around 8,600 inhabitants

(Statistics New Zealand, 2005). New Zealand has followed a common feature of 20th Century urban development in North America and Australia, which is the dominance of low density suburban and peri-urban landscapes, often referred to as urban sprawl. In Christchurch the flat terrain and the absence of physical barriers to expand to the north and west facilitated a decentralized pattern of development, tending towards a polycentric city. The adoption of green belts was an attempt to contain the city's growth within the built-up area and the adjacent suburbs (Memon, 2003). This strategy has not worked out as expected and Christchurch continues to progressively occupy these greenbelts and expand its area, especially after the earthquakes.

The archetypal New Zealander home reflects an ideal of urban living which is different from that offered in most of the central city area. Usually single-story, single-family, detached houses preferably sited on quarter acre sections – or the quarter-acre dream (A. Mitchell, 1972) – are considered the ideal form of dwelling in New Zealand (Bennett, 2010). This type of property allows a closer connection to nature still prevalent in New Zealand today (Perkins & Thorns, 1999). Meanings attached to a certain 'atmosphere' or lifestyle, are therefore strongly evident in Christchurch. The urban solutions implemented in the city by its founders[22] are examples of these views of a healthy and natural urban environment, which generated the ideology of a Garden City.

Vallance, Perkins and Moore (2005) have investigated people's interpretation of the increase of density and consequent loss of green areas as a consequence of urban infill in Christchurch. The authors highlight some important aspects of the local city living and its meanings, such as the need for space for children and pets, and the importance of a vegetable garden – which helped build the *New Zealand way of life*, the quarter-acre living style. These factors added to the adverse effects of traffic, noise and pollution largely outweighed the benefits of a more consolidated city form. The authors conclude that despite the poor reputation of suburban life among many academics, Christchurch people prefer quiet suburbs with little traffic. Another interesting outcome was the relationship between infill and the *Garden City* as residents associated the urban infill and the higher density threatening the image of the Garden City (Vallance et al., 2005). The image of nature in opposition to the industrialized world – in Christchurch, represented through the Garden City ideology – has been present in New Zealand since the early settlers (Ferguson, 1994). It has been argued by Craig et al. (1993) for instance that Hagley Park, as an open space, has probably done more for Christchurch's economy than if it were built on.

New Zealanders are also protective of their privacy and sunshine (A. Mitchell, 1972; Vallance et al., 2005). Large sites separate individual dwellings from one another and from the street, providing

[22] Edward Gibbon Wakefield a leader of the organised European settlement of New Zealand and John Robert Godley are known as the 'Founder of Canterbury' (Christchurch City Libraries, 2013)

privacy. This large distance also ensures that houses do not block sunlight from each other. The quarter-acre dream has been considered ideal as a result of its interface with nature, provision of privacy, and natural light (Perkins & Thorns, 1999). The concerns regarding natural light have been considered on the city plan where distances and recession planes are intended to protect these characteristics. However the urban environments, especially streets, are frequently treated as a merely functional space.

Among other variables, urban life is influenced by this desire to have privacy or social interaction – influencing urbanity – and sunshine and wind protection to be able to enjoy the city environment. Indeed, the same elements used to provide privacy can be used to amend microclimate. These could work as good design elements to improve liveability in Christchurch public open spaces while improving the sense of belonging as vegetation is an integral part of the Garden City. The case study sites and how these variables have been taken into account are discussed in the next section.

5. THE CASE STUDY SITES

The theoretical rationale for the choice of case study sites has been presented in Chapter Three and is expanded in this section regarding the case study sites themselves. The case study sites were chosen based on similarities to important streets in Christchurch's Central City or CBD (Central Business District), such as layout and orientation, microclimate, vibrancy and uses, with the intention of providing different configurations of urban space. The two key variables were the space condition pre- and post-earthquake and the impact of their urban form on the microclimate, as explained in Chapter Three. The investigation started with two established urban settings that were minimally affected, and extended to two new emerging urban settings which had been re-designed as temporary post-earthquake solutions. The next sections present the three areas where the four case study sites are located, and the four case study sites themselves, including the reasons for incorporating each of them in this research.

5.1. Rotherham Street and Windmill Centre, in Riccarton

Two of the case study sites of this research are located in Riccarton. Riccarton is a suburb located along one of the main transport routes and approximately 2km away from the central city. It is separated from the central city by the 165ha Hagley Park. Until the local government amalgamation in 1989, Riccarton was an independent borough (Christchurch City Council, 2010b). Since then Riccarton forms part of the Riccarton-Wigram community board and is represented by two elected councillors who represent around 61,000 people and 21,500 households (Christchurch City Council, 2010c). The area of this community board extends from Templeton in the west, across to Riccarton, and south to Halswell.

The Riccarton suburb itself has distinctive features including the largest shopping mall of the South Island as well as the University of Canterbury. The suburb is bounded by Hagley Park and strongly connected to the central city through transport services. The Westfield Riccarton (or Riccarton Mall), the University and the surrounding shopping areas and services expand the suburb catchment area, and therefore it attends more than just its residents. The population of Riccarton varies regarding its dwellers occupation, housing, age, family structure, incomes and levels of education. The suburb also has a very diverse population where 32.4% are Asians. This is a high percentage if compared to the neighbouring suburb of Fendalton where only 6.5% of the population are Asians. Riccarton also has larger numbers of Maori, Pacific and Middle Eastern residents compared to other Christchurch suburbs (Moore, 2012). This diversity gives the suburb a particular character as the types of shops and amenities provided in the area cater to these different ethnic groups.

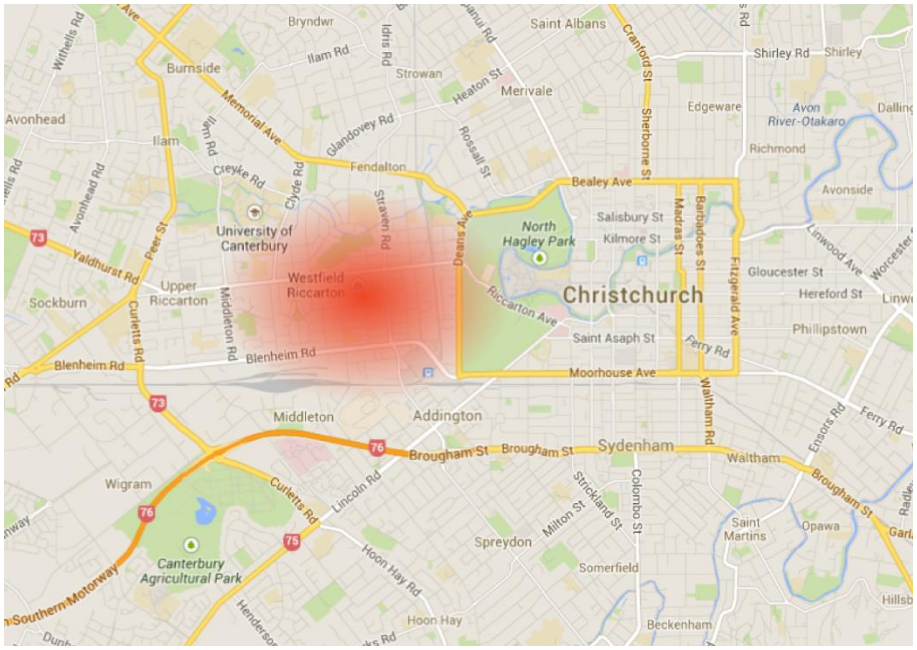


Figure 13: Location of Riccarton[23] (base map source: Map data ©2014 Google)

The suburb provides various opportunities for shopping, recreation, business and housing. It is a mix of medium and low density housing, with some light industrial areas. Riccarton Road is the main street crossing trough the suburb and has its main uses focused on commercial and community activity. The street splits the suburb in two, creating a distinct contrast between the north and south in terms of housing. The south offers lower rents and is largely occupied by students because of the proximity to the University of Canterbury. The north features larger properties on larger sections, reflecting the history and amenity of Riccarton House (Moore, 2012).

[23] The location of Riccarton (Figure 13), the Central City (Figure 17), and Sydenham (Figure 20), are based upon the location of the case study sites (roughly in the centre of the red mark). The limits of these areas of the city may vary according to official documents, census, and post numbers, and therefore are only indicative.

Riccarton is located in the western area of Christchurch and has been minimally affected by the earthquakes. Because of this condition, businesses and population have rapidly shifted to this area of the city. Riccarton has been the main focus of this shift, being at times referred to as the *new central city* and served with the best public transport around post-earthquake Christchurch. This new scenario has generated an increasing pressure on the existing infrastructure.

The two Riccarton case study sites are the established urban settings, reflecting the minimally damaged character of the area post-earthquake. The two sites (Rotherham Street and Windmill Centre) are close to each other (Figure 14) but differ regarding urban morphology and microclimate. They were also the first sites to be investigated at the pilot stage, along with the site in Rangiora which was later discarded.

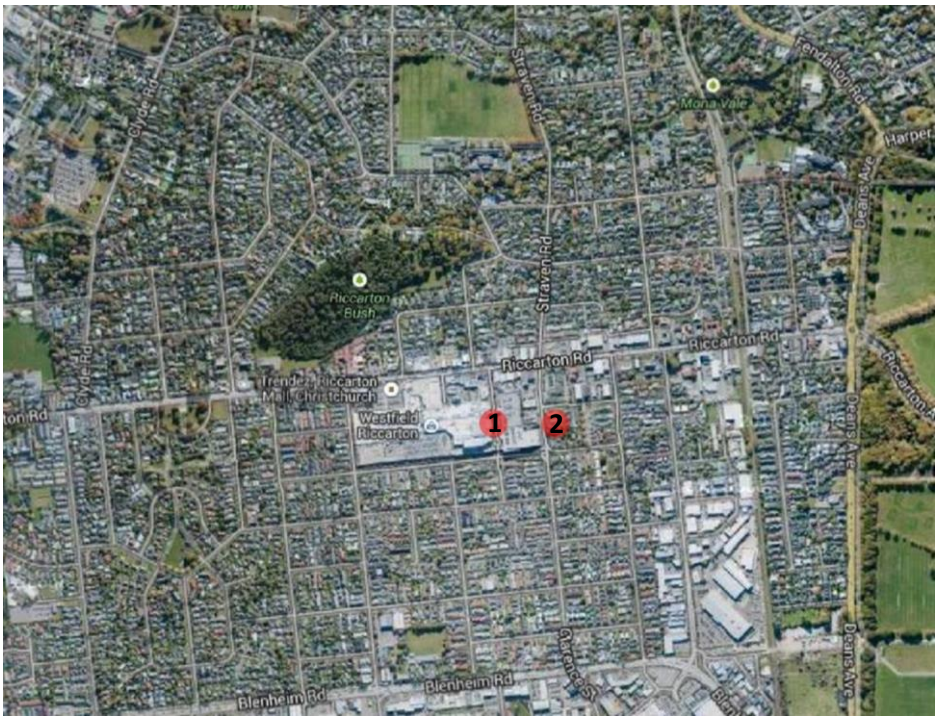


Figure 14: Location of case study sites in Riccarton: Rotherham Street (1) and Windmill Centre (2)
(base map source: Imagery ©2015 Google, Map data ©2015 Google)

Rotherham Street

This case study site was chosen for its established character shortly after the earthquake and its physical similarities to many former inner city streets, including Cashel Mall (see 5.2). The urban form also corresponds to the proposed rebuild design of tight urban streets, common in the central city.

This site is a street block, located between the Westfield Riccarton and its multi-level car park building. It has the main door of the shopping mall, plus a few shops, restaurant, cafés and pub. This site is not a pedestrian street, but has slow traffic, in a pedestrian friendly environment. The street

has some greenery and urban furniture, where people linger waiting for friends in their lunch breaks or after school hours.

Figure 15: Rotherham Street

The site is an extension of Westfield Riccarton and the activity on the street is largely enhanced by the presence of the mall. Westfield Riccarton is a large retail complex with a total of 170 stores (Moore, 2012) which physically dominates the suburb environment and works as the main attractor for the area. A large proportion of the mall is occupied by retail and a large area of the remaining space is used by food courts and entertainment facilities. Riccarton Mall was first opened in 1965 and is Christchurch's oldest shopping centre (J. Wilson, 2012). The mall underwent a redevelopment in 2003, focusing heavily around a leisure component with the addition of a cinema and gym facilities. In 2009, the mall expanded again, increasing its overall size to 54,000m² and turning into New Zealand's third largest mall. At the same time Riccarton Mall changed its ownership and was rebranded Westfield Riccarton (Moore, 2012).

The significance of Westfield to the city and especially to the surrounding area can be grasped based upon the number of visitors. In 2006, before the last renovation, Westfield Riccarton had an annual visitor number of 8,678,000 people (Moore, 2012). The number of visitors is significant when

compared to the 484,585 visitors Canterbury Museum received in a period of one year (Canterbury Museum, 2013). The importance of the mall to the city has also been highlighted by the earthquakes with its sales increasing by 16.3% in 2011 (Fairfax, 2012).

Despite the success of the mall as a local focus, Westfield Riccarton has a typical typology of an indoors mall, providing little interaction with the surrounding streetscape. This condition is moderated by the presence of Rotherham Street, as described by Moore (2012, p. 112):

> The only exception to this blindness is where the mall is divided by Rotherham Street. Here the shops face into the road with wide footpaths and a traffic calmed street. There are amenities such as benches and planting that improves [sic] the aesthetic appeal. The place is a pleasure to experience on a nice day and people's enjoyment of the space is evident where they can utilise the exterior spaces. However the drawback is the North South orientation that acts as wind tunnel.

The comparison between Rotherham Street and Cashel Mall, the other building-defined street, shows the differences between a social setting that was trying to carry on after the earthquake and a complete new environment, and the microclimate differences between north-south and east-west oriented streets. Cashel Mall is now more integrated to its surroundings, but at the time of this work's field research it was an isolated outdoor mall surrounded by demolition and early rebuild efforts.

Windmill Centre and Ed Hopper Café and Bookshop

The Windmill Centre is the other established urban setting and the fieldwork in this site also started in the pilot stage. The site is close to Rotherham Street – located in the next parallel street – but the urban environment and the users are very different. Windmill Centre is a commercial area constituted by one story buildings organised around a car park. The commercial centre establishments are mainly restaurants, shops, hair dresser and a café. The parking area has very little greenery and predominantly consists of a hard landscape. It does not include benches and urban furniture.

In the 2012 summer – just after the pilot study – the café closed for renovations. When it reopened some of the early characteristics had changed. It used to be a specialised book shop, which sells coffee, but after the renovation it became more of a café and less of a book shop. It also increased the sales of alcoholic beverages, which later proved to have influenced the activity, user types and peak hours (see Chapter Five).

This site caught my attention because of the number of people using the open space of the café even on colder days. The landscape in this setting is dominated by the central car park, but because of the

orientation of the area – it faces north and is protected from the east – the microclimate tends to be very benign and attractive even though the landscape looks unattractive and dominated by cars. Moreover, despite the café being located adjacent to a busy street, the design of this space simulates the impression of being further away from the street traffic. The fieldwork in Windmill Centre served the purpose of investigating microclimate design as an anchor for successful urban design efforts.

Figure 16: Windmill Centre

5.2. Cashel Mall, in the Central City

Christchurch Central City is the geographical centre and the heart of Christchurch. Before the earthquakes, it was defined as the area limited by Bealey Avenue, Fitzgerald Avenue, Moorhouse Avenue and Deans Avenue, therefore including Hagley Park and the Botanic Gardens (Figure 17). The streets within the four avenues follow a grid pattern which is interrupted by the Avon River and the two diagonals – Victoria and High Streets. At the centre of the CBD is located the Cathedral Square which hosts the Christ Church Cathedral.

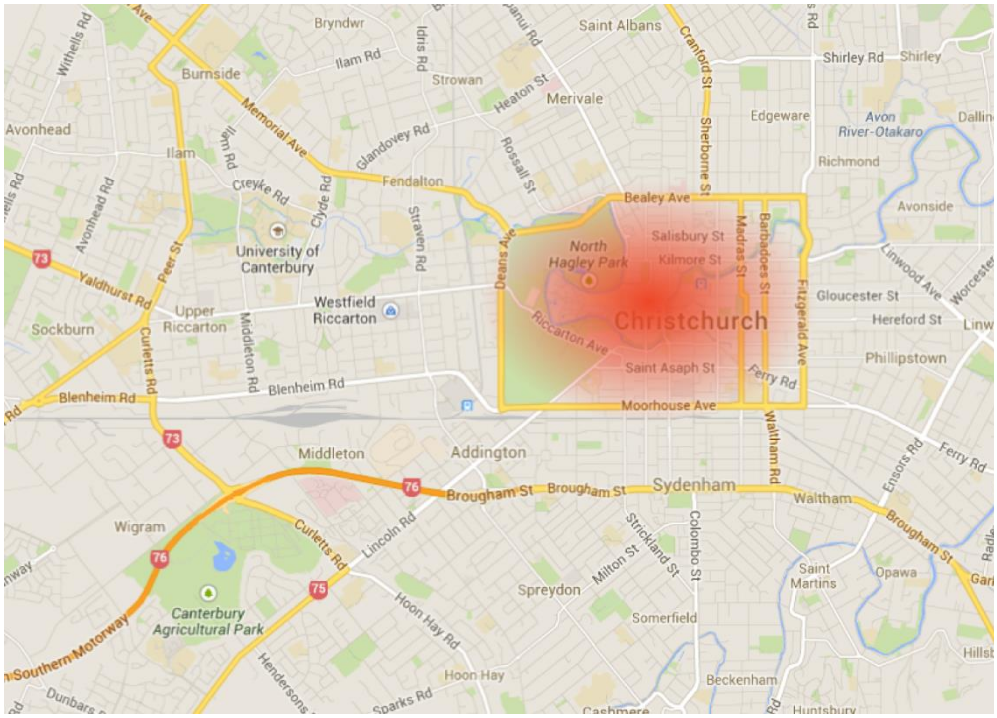


Figure 17: Location of the Central Business District (CBD), or the Central City (base map source: Map data ©2014 Google)

The central city was populated by a group of buildings and monuments including the Arts Centre, the Art Gallery, the Canterbury Museum, the Bridge of Remembrance, New Regent Street, Christ Church Cathedral, the Catholic Cathedral, Canterbury Provincial Council Building, the Town Hall, the Oxford Terrace strip and Cashel Mall. All these buildings and their meanings constituted a sense of place (Cresswell, 2004; Tuan, 1979) which had an important role on the identity and sense of belonging to Christchurch people. They formed the heart of the city (McBride, 1999; Temple, 1987).

The expansion of suburban shopping malls in the 1960's decentralised the central city commercial and educational activities (Christchurch City Council, 2011a). To cope with the pressures imposed by the competition from the shopping malls, the City Mall had been renovated and was extensively used prior to the February 2011 earthquake. The City Mall is a section of Cashel Street – between Oxford Terrace and High Street – and a section of High Street – between Cashel Street and Hereford Street. These sections of Cashel and High Streets became the City Mall in 1982 when the Council turned it into a pedestrian only area. The works on the new pavement were completed in three stages, during the following 10 years.

Before the 2010 and 2011 earthquakes, the central city offered a large number of retail, cafés, restaurants and bars, having the largest selection of hospitality and entertainment in the South Island. It also had a heritage tram which has been in place since 1995 and was expanded in 2010. The system does not fulfil a public transport and urban mobility function; instead it is aimed at tourists (Central City Business Association, 2009b). The City Mall was one of the most important public and commercial areas in Christchurch, and an area that reinforced the identity of the city.

> It is an iconic part of our city that holds a special place in our hearts and minds. The mall plays host to visitors and guests, leaving a strong impression of Christchurch. More importantly, it reflects how we care and feel about the heart of our community. (Central City Business Association, 2009a)

In 2010 the Christchurch City Council released the project *A City for People*. The project consisted of an action plan to implement the *Public Space Public Life Study* undertaken by Gehl (2009). The project had the objective of promoting vibrancy and safety, and making the central city attractive and a place where people want to be.

> The implementation of the action plan is planned for the next 12 years, recognising that great cities take time to develop. By 2022, Christchurch's Central City will have a human pace, invite people to walk, sit, relax, socialise and be entertained, and with a vibrant, safe Central City the foundation will have been laid for future growth and prosperity. (Christchurch City Council, 2010a)

The recent earthquakes put these plans on hold and create an empty canvas to rebuild the central city. It brings a new opportunity to rethink many aspects of the area, including its open spaces.

The February 2011 earthquake forced the closure of all heritage buildings located in the central city for at least a few months and others still have their destiny uncertain (Canterbury Earthquake Recovery Authority, 2013). Following the February 2011 earthquake, Cashel Street remained isolated for eight months as part of the Red Zone. To fill this gap left by the loss of iconic places and to provide a reason for locals to come back to the area, temporary sites started to emerge as soon as the Red Zone was reduced and some sites became available. In October 2011 the Re:START project – or the Container Mall – opened to the public, and was added as a case study in this research in May 2012.

The new Cashel Mall is located in Cashel Street (Figure 18) – an east-west oriented street – and consists of a series of colourful containers which host cafés, food courts, stores and toilets. Along with Ballantynes[24], the Re:START project was the anchor for the revival of the inner city.

[24] Ballantynes is a department store in Christchurch Central City which was opened in 1854 and was originally named Dunstable House. Ballantynes is part of the BCG Alliance, group committed to the rebuilding of Christchurch especially through the development of the Central City Retail Precinct. They all share a very deep commitment and sense of obligation to step up and play a lead role in the recovery (Ballantynes, 2013).

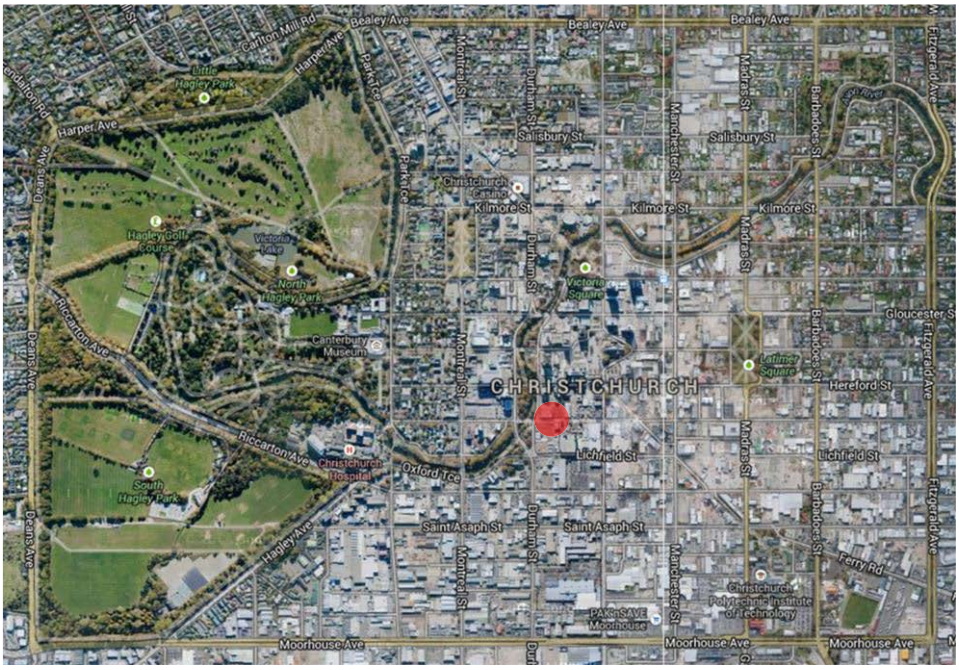


Figure 18: Location of Cashel Mall (marked in red), the case study site in the Central City (base map source: Imagery ©2015 Google, Map data ©2015 Google)

Cashel Mall remains a pedestrian based street and, at this stage, covers only one block. Trees, well-tended gardens, buskers and Ballantynes are currently the main attractions of the area. The role of the Re:START mall and Ballantynes on the city rebuild process is of particular importance and the choice for this site was due to its symbolic significance in a post-earthquake environment and its current changing nature. The transitional sites and how local residents are adapting to these environments can help understand adaptation and explore future design possibilities.

> Cashel Mall will open first and will act as a gateway to the rest of the city centre. Re-locatable expo-style structures will be used by retailers and hospitality owners who are not able to re-open in their existing buildings in the inner city. (Fairfax, 2011a)

Figure 19: Cashel Mall

5.3. South Colombo Street and Coffee Zone, in Sydenham

Sydenham is one of Christchurch's oldest suburbs. It joined the Greater Christchurch in 1902 and in 1977 it celebrated its centenary (New Zealand Federation of University Women, 1977). The decision to become part of Greater Christchurch is believed by locals to have done some harm to Sydenham identity:

> In the days of borough administration Sydenham people had their own identity and Sydenham was a place with defined boundaries. Today no one is quite sure where Sydenham is (…). Though recently moves have been made to recapture a local sense of identity and committees have been set up with the aim of forming a community council. (New Zealand Federation of University Women, 1977, p. 92)

More recently Barrow (2000, p. 5) has suggested that Sydenham still has "a sense of identity and regard for a history that many residents and business people in Sydenham community retain". However, this sense of identity does not mean that Sydenham has recovered or improved; rather it became fragmented and has lost its centre and focus.

The suburb can currently be defined as the area of Sydenham bounded by Moorhouse Avenue, Waltham Road, Eastern Terrace, Tennyson Street, Colombo Street, Strickland Street, and Antigua Street (Barrow & Spreydon-Heathcote Community Board, 2000). The building uses in Sydenham are predominantly commercial or industrial on the north side of Brougham Street and residential on the south side of Brougham Street.

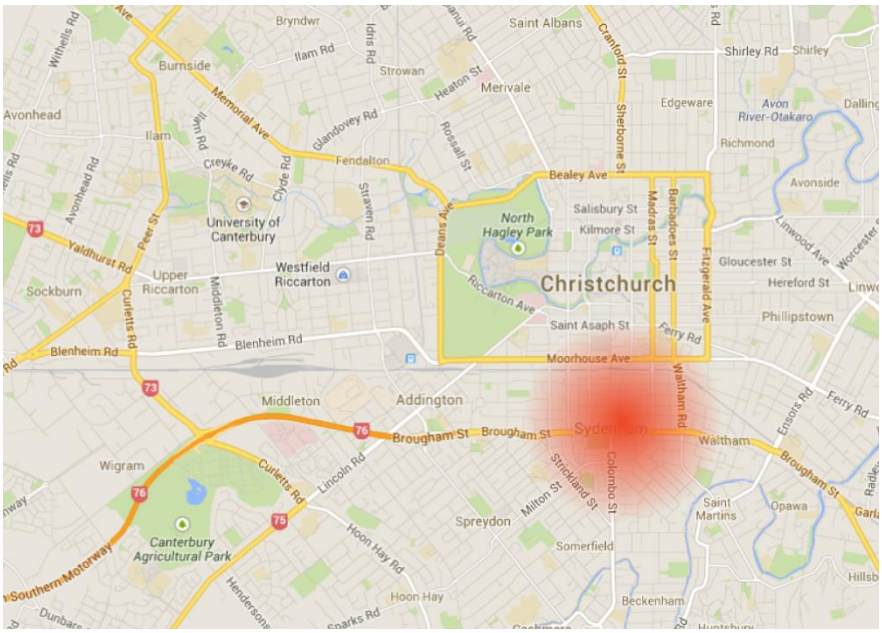


Figure 20: Location of Sydenham (base map source: Map data ©2014 Google)

Sydenham has a commercial strip along Colombo Street, with the Beckenham Shopping Centre located in the Southern area, and there is a small commercial centre at Waltham Road/Hastings Street. Some industrial buildings are located on Waltham Road and Austin Street. Visually Sydenham's most significant characteristics are its older style homes, mostly wide roads and absence of soft landscape. Sydenham Park and Bradford Park are the most significant open areas of the suburb, both in the northern area, and the Heathcote River in the southeast (Barrow & Spreydon-Heathcote Community Board, 2000).

The New Zealand government adopts the Deprivation Index (NZDep2006), which combines nine variables from the 2006 census reflecting eight dimensions of deprivation[25]. NZDep2006 deprivation scale varies from 1 to 10 where 1 is least deprived and 10 is most deprived (Salmond, Crampton, & Atkinson, 2007). Sydenham scored 9, therefore a significant portion of Sydenham residential area is classified as 'most deprived'. In the same index Riccarton scored 8, however Riccarton is a suburb where rentals are common due to the presence of the University, for hosting more immigrants and for being a more commercial area. Barrow and Spreydon-Heathcote Community Board (2000) have also found that the Sydenham Community Profile confirmed that it is an area which was experiencing larger than average hardship and poverty. The largest community concerns regarded lack of street parking, lack of public open space, Bradford Park maintenance, lack of landscape linkages, lack of local focal point, off-street parking (Shopping Centres).

[25] Income support, low income, unemployment, single parent families, no education qualifications, not owning a home, limited living space, no telephones, no access to cars.

One of the most enduring problems faced by residents and businesses in Sydenham has been the reoccurring problem of loutish behaviour, vandalism, graffiti and racing vehicles along Colombo Street and streets off Colombo Street (Barrow & Spreydon-Heathcote Community Board, 2000). Sydenham is an old suburb that was marginalised before the earthquakes, but the post-earthquake picture is somehow different. Many shops located in the central city prior to the earthquakes moved to a recently renovated shopping mall – The Colombo – which now offers a boutique cinema and a Belgium Beer Café, both relocated from the central city. These new uses changed the character of the area, and most of the shops have a quirky character, matching the new temporary sites that took place along Colombo Street.

The emerging urban setting located in the South Colombo Street was the last area to be added as a case study site.

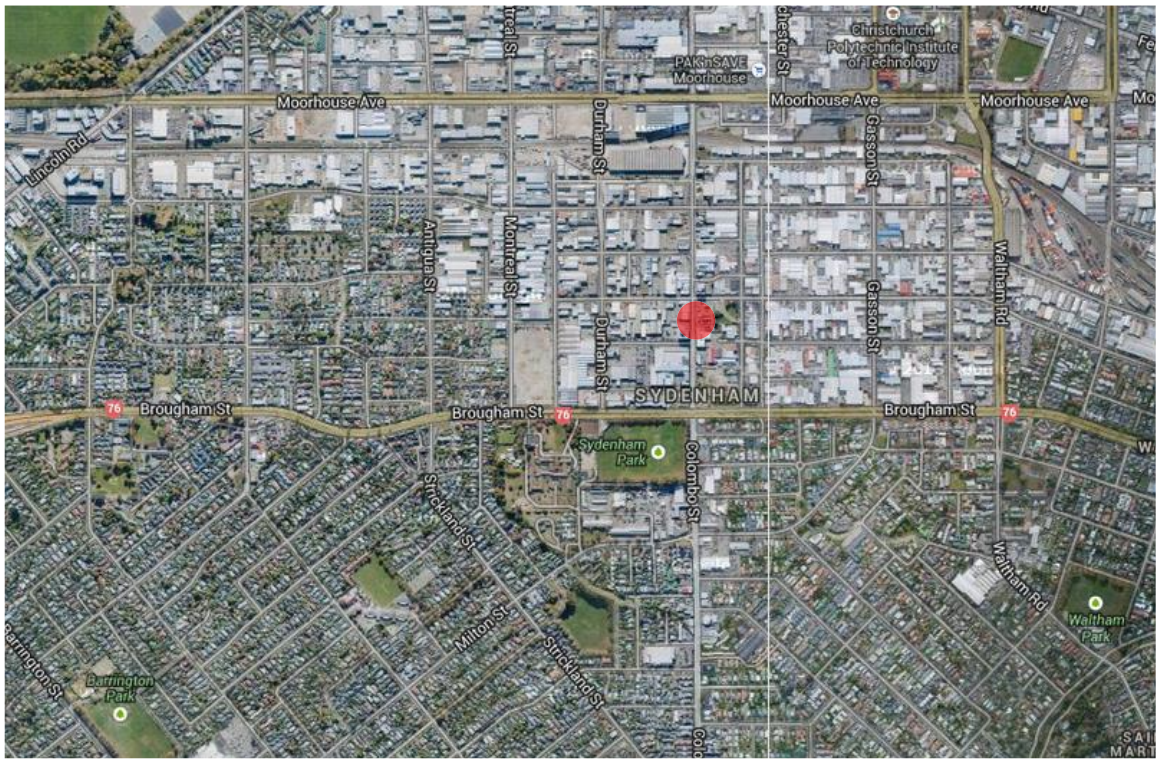


Figure 21: Location of the South Colombo Street site (marked in red), the case study site in Sydenham (base map source: Imagery ©2015 Google, Map data ©2015 Google)

The site itself consists of a landscape-defined street surrounded by a few empty sites where some containers have been placed and are currently used as dairy, services and stores. It also hosts a garden area, with a picnic table, a gazebo and a café. It has tables, chairs and benches, and a mini-golf course, all within the vicinity of the café. The area is part of the Gap Filler (2013) and Greening the Rubble (2013) projects. It is surrounded by offices and is not far from The Colombo mall. The Gap Filler head office was located in the corner of the café area but has since been removed, emphasising the changing nature of the site. Although it is part of a temporary project, this site is similar to the

Windmill Centre in the sense that it is client focused, but it has a very different urban form which results in a different microclimate in a largely unprotected urban space.

Figure 22: South Colombo Street

6. SUMMARY

This chapter introduced the research context – post-earthquake Christchurch – based upon its geography, climate and cultural identity. The local geography with its hills, rivers, mountains and beaches stimulates the development of a local outdoor culture. The temperate climate requires some adaptation strategies so the connection to the outdoors can be largely enjoyed. New Zealanders, and especially Christchurch, cultural identity is closely connected to the nature and the need to have instant access to open spaces. This generates specific aesthetics requirement regarding the city environment.

The last section of this chapter introduced the case study sites based upon the context where they are located within the suburban areas or the central city. Riccarton is the suburb where two of the case study sites are located: Rotherham Street and Windmill Centre. The case study sites in Riccarton were minimally affected by the earthquake and the suburb post-earthquake have often been referred to as the 'new central city' as it offers services, entertainment and amenities as the central city used to prior to the earthquake. The central city as a whole was important to the local identity,

and Cashel Mall, as the only accessible site post-earthquake, served as a sample of the life in the central city. Sydenham is an old suburb which was marginalised before the earthquakes. It is an area where the post-earthquake environment seems to have improved the previous condition. A brief history of each area as well as the main attractors and the sites' pre- and post-earthquake condition were presented.

CHAPTER FIVE: The social character and dynamics of the case study sites

Post-earthquake Christchurch presents a unique opportunity to design urban landscapes which promote urban liveability and sustainability. The success of these efforts depends on how well the city will respond to the local socio-cultural values and needs. In Christchurch, the connections between urban and rural settings present in local landscape, lifestyle and culture generate a particular aesthetic and recreation preference for urban spaces. Taking into account these preferences when designing urban landscapes is the key to promoting liveability in the city (Leby & Hashim, 2010; McCrea & Walters, 2012; Timmer & Seymoar, 2006).

A main objective of this research was to explore the meanings of regional physical and social landscapes in the local culture and how it influences urban comfort in Christchurch. The results of this work are presented in three linked chapters. In this chapter I present the main similarities and differences across the case study sites, their dynamics and general microclimate. The results presented in this chapter are based upon climatic data collected in the sites during the fieldwork, NIWA's Kyle Street Weather Station data, observations, field notes[26], and in-depth interviews. The interviews sample a cross-section of users of the case study sites at the time of the fieldwork.

I started the fieldwork eight months after the February earthquake. At that stage local people were trying to go back to their normal lives, but with not many places open in the city they were frequently forced to go to places they would not normally choose.

Both established and emerging settings (Chapter Four) had – and still have – very important and diverse roles in the post-earthquake environment. While the established settings aimed to keep 'things going' and were important for providing a sense of continuity and normality, the emerging settings provided new hope and the feeling that what will be done will make the city even better than it was before the earthquakes, as expressed by an interviewee:

> *"There are some cool bits, and there's a lot of demolition, but there are some cool things that popped out and makes me excited (…) [Cashel] mall is awesome now… It's amazing, and those little bits sort of give you faith of what could be. It's not so scary anymore… You see people demolishing buildings, but that's part of the process. It's working towards a better thing."* (E67)

In this research the social character of the sites – both emerging and established settings – proved to be an important factor regarding adaption to the microclimate. In other words, the social character

[26] The quotes from field journal are illustrative, as these observations were repeated in many days of fieldwork.

defines what type of public each of the sites attracts, what time it is quieter or busier, what is considered attractive and how the climate shapes the use patterns in the setting.

One of the main features highlighted by the respondents was that the environment has to be interesting and vibrant, and still provide *enough* personal space in a way they have peace but "*you are not going to be the centre of attention"* (E51) for being the only one in the place. The balance between the sense of personal space and the city life defines if, and how, people use public open spaces, and consequently their will and capacity to adapt to the microclimate.

The case study sites were chosen based upon their post-earthquake condition and their urban form (as explained in Chapters Three and Four). The objective was to explore how these two main variables influence locals' adaptation to the weather and climate. The results presented in this chapter showed that there was a third important variable: the social nature of the urban settings. As a result of this, the case studies were then classified as urban social spaces – the ones that have their main activity based upon social interaction – and urban retreat spaces – which have their main activity based upon people alone or in small groups and peaceful environments instead of social interaction. This is an important difference identified in the case study sites as social spaces and retreat spaces each generate different adaptive practices.

The social character of the case study sites was based upon Sommer's (1969) consideration of variations on personal space. Therefore *urban retreats* are quiet spaces, where people meet in small groups or just go by themselves to have some 'peaceful time' (as described by some respondents). These spaces are not necessarily isolated or protected from traffic, but their design provides a buffer from street activity. *Urban social spaces* are more vibrant settings where users can meet friends or even go alone and still be part of the social scene. Therefore, urban social spaces and urban retreat spaces have a variation on their levels of urbanity (Castello, 2010; Montgomery, 1998).

The following section introduces the four case study sites according to their social character. The so-called social character affects and is affected by the microclimate and it proved to be more or less important according to the characteristics and attractions these sites provide. The use patterns in each site are also affected by the microclimate as it is highly variable according to the sun and the winds as described in this chapter. The type of public and customers, the use patterns and the attractions of each place are discussed in relation to each site's specific microclimate.

1. URBAN SOCIAL SPACES

In urban social spaces, use patterns are more regular and predictable than in urban retreat spaces, as they are mainly dependent on the presence of people. There are peak and quiet times, when there

are more or less people in the site and this condition tends to attract different types of users along the day. Because the social interaction is the focus in these sites, undesirable climatic events do not affect the urban life, although extreme weather – such as snow or rain combined with wind in cold days – influence the social life. Therefore, data shows that the influence of climate and the extent to which it is expected to be 'perfect' is more flexible in urban social spaces than in urban retreat spaces.

1.1. Rotherham Street and Coffee Culture

Rotherham Street was chosen as one of the case study sites because of its main retail use and for being a denser and people-based space as Cashel Mall was prior to the earthquake. The number of people in the space was affected by the inaccessibility of other areas of the city, and Riccarton, where the mall is located, became the new city centre for over a year, while the CBD was still cordoned off. This condition increased the number of people in the area, and affected the number of people in Cashel Mall when it reopened. Some participants said they had never been to Riccarton before the earthquakes, because they did not need it, others said they shifted to that area of the city and were resistant to go back to Cashel Mall because of the memories from the earthquake.

The fieldwork in Rotherham Street started in the pilot stage of this research in October 2011. The street is oriented north-south and surrounded by the shopping mall building, with one, two or three floors along this block. The section of the street where this fieldwork took place is a block adjacent to the Westfield Shopping Mall in Riccarton (Figure 23). The café where the weather station and the computer were placed is located in the east side of the street, facing west. It has six tables placed outside in the street space.

Figure 23: Rotherham Street facing north (sketch by author)

The number of people in the street is due to the location of the main door of the mall and nearby stores, restaurant, cafés and pub. This site is a slow traffic and pedestrian friendly street and includes some greenery and urban furniture, where people linger waiting for friends, in their lunch breaks or after school and work hours.

> *"We've got a good mix of age. (…) 'We get a lot of businesses who come in for meetings, lots of business people for lunches, but our most loyal customers, almost regular customers are middle aged women with children."* (M01)

In Rotherham Street the interviews were carried out with 31 individuals of varied ages. Teenagers and young adults, especially women, were the predominant users of the space at the time of fieldwork. In this site the users belong to a very wide range of age, activities and lifestyles. The users of this site do not vary as much during the year, but here the significant variation is throughout the day. In a general sense, both the street and the café are busier from 10:30am and the street is busier in the afternoon. On Thursdays and Fridays the shopping mall closes at 9pm, and then there is a different public in the evenings. The varied public, observed most days of fieldwork, can be described according to four main distinct periods of the day:

1. **Before 9am**: The morning users of this space are *"predominantly women with young children and, in a much smaller number, business men"* (field journal, 17 July 2012). There are also plenty of elderly people before 9am, time that the shopping mall opens and then more varied people start using the space. *"The elderly usually go to the supermarket in the calmer morning hours"* (field journal, 29 August 2012).
2. **From 9am to 11.30pm**: Predominantly women shopping and with young children. "*Before 10:30am the street is quiet but the indoor area of the café tends to be busy, and when the sun comes out, the number of people outside increases"* (field journal, 24 April 2012). Number of people in the area also increases considerably towards lunch time, shifting from supermarket shopping and elderly users to young adults.
3. **From 11.30pm to 1.30pm:** *"The mostly female morning crowd is joined by business people and workers that use the area for their lunch breaks"* (field journal, 24 April 2012).
4. **After 1.30pm**: The fourth group comes after lunch and has an increasing number of men, *"Asians and teenagers in uniforms going to and coming from the mall"* (field journal 14 February, 2013) after school hours. The last two groups use the space predominantly after 3pm and especially on Tuesdays and Fridays, when the mall is open until 9pm.

Although the times listed above are the general use pattern, the site has two inter-dependent focuses: the street itself and the food establishments that place outdoor tables in the public footpath (Figure 24).

Figure 24: Rotherham Street looking south (a) and Coffee Culture (b)

In the street, during the week the public benches are predominantly used during lunch time by people that work in the mall, or are waiting for friends and family. "The benches that are more frequently used are the four around the *pedestrian crossing lane"* (field journal, 17 July 2012 – Figure 25b). The crossing lane is located closer to the main door of the mall, where there are more people walking by. The café where the research equipment was placed has six tables outside and on each extreme there is a windbreak. Customers of this café tend to use more frequently and for a longer time the tables close to these protections (Figure 25b).

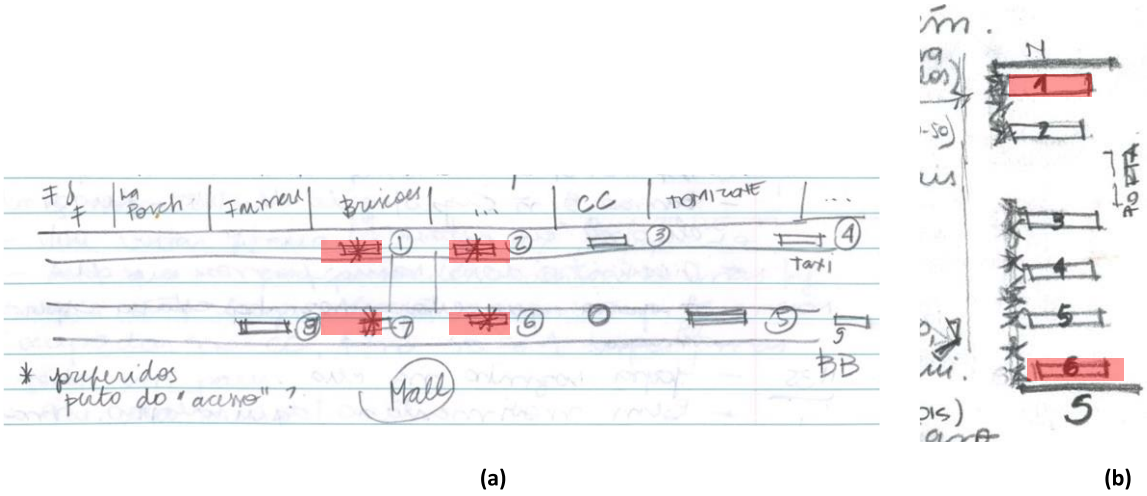


Figure 25: Popular benches in Rotherham Street marked in red (a); most popular tables in Coffee Culture marked in red (b) (sketches from field journal)

The café *"faces west, the sun reaches the east façade of the shopping mall and reflects the sun in the glass façade to the café area around 9-10:30am, it is almost like having a 'second sun'"* (field journal, 27 March 2013). Across the street there is another café which is part of a worldwide franchise and which is exposed to the sun early in the morning. In warmer days (especially spring time) both cafés – in both sides of the street – open their large doors and make the inside and the outside an integrated

space. In this site users tend to look for a place with the best microclimate as the manager of one of the cafés described:

> *"They do look for sun a lot which means in the afternoons it is a lot busier outside because we don't tend to get the sun until later. There are some people that would go there [the café across the street] earlier in the morning because it is sunny and they can sit outside in the sun but then in the afternoon they prefer to come here."* (M01)

Figure 26: Façade facing west with Coffee Culture outdoor area (sketch by author)

As an urban social setting the microclimate tends to define what the busiest areas of the setting are, but the main attraction of it is people. The interviewees said to like the area because it is people based and has a human scale, although the mall building can look oppressive because of its size. It has a pleasant microclimate, with not much sun because of its north-south orientation, but it is also protected from the local prevailing easterly wind, which makes it an even more attractive place in the brief afternoon period when the sun reaches the area. Although the success of the space is not completely dependent on microclimate, it tends to increase the number of people in the setting when it is warmer and sunny. During the fieldwork, in a sunny spring day all tables outside the café and benches around it were full and some people were sitting on the edge of the planters with their drinks to take away.

In warmer sunny days – even during the winter – there were some buskers in the street (field journal 23 August 2012). The place chosen for that activity was across the street from the main entrance of the mall, in an area exposed to the afternoon sun. Both cafés in this block are also located close to the main entrance of the mall generating a point of attraction. Because they generate more interest increasing the number of people, the benches located close to this area are the ones more frequently used, and therefore the area also attracts buskers.

Regarding the local microclimate, as usual in cold climates people tend to look for sunny spots, especially in places with low humidity. In some cool mornings – around 9:30am – both the café and the mall had a fair amount of people inside but no one was outside, *"even the [take-away] waiting places in the café [which are usually the outdoor tables], in this climate condition changed to the indoor benches close to the door"* (field journal, 21 September 2012). Moreover, especially in colder days, during winter, *"at 11:00am there wasn't a place to sit, as all the benches remain wet"* (Figure 27 and field journal, 17 July 2012) while the sun does not reach them, close to lunch time. The benches are made in aluminium and the perception of this material is very cold in winter days. The furniture becomes more comfortable as soon as the sun reaches the space, a situation that also made more *"difficult to do the interviews as there wasn't many people outside apart from the ones walking"* (field journal, 17 July 2012), and therefore the place was an area of few passers-by.

Figure 27: Rotherham Street at 10:10am on the 17 July 2012. Aluminium seats in the foreground still wet and not functional.

During winter time, people outside were usually standing, some were smoking and others eating standing close to the walls. Smokers have different patterns of behaviour in outdoor areas, as they have an extra reason for using public open spaces (Zacharias et al., 2001). Walton et al. (2007, p. 3168) have studied the use of public open spaces in Wellington, New Zealand, and noted:

> Legislation in New Zealand currently prohibits smoking in business places (excluding cafes and bars) and the consequence is that smoking is commonplace in public spaces serving the office buildings of the Central Business District. Smoking is a different motivation for occupying the outdoor space, and the individual has little or no choice about the conditions of that space if their intention is to smoke. In contrast, a person seeking to sit in an outdoor environment may have their motivation strengthened or reduced by the conditions of the space.

The place where the weather station was located in Rotherham Street was very protected (see Figure 6), as were the tables in the supporting café, which is located in the east side of the street facing west. For these reasons minimal winds have been registered. The microclimate measured on-site

showed differences when compared to the data acquired from NIWA. Table 3 shows the data regarding maximum temperatures, wind direction and wind speed measured on site and downloaded from NIWA's CliFlo database. The data show roughly similar values apart from RS7, with some days when the microclimate was warmer in Rotherham Street and others when the temperature data collected by NIWA presented higher values.

Site	Day[27]	max temp (°C)		wind direction		wind speed (Km/h)	
		on site	NIWA	on site	NIWA	on site	NIWA
Rotherham Street	**RS1**	25.0	20.8	no wind	NE	0.0	10.0
	RS2	23.6	24.6	no wind	NW	0.0	3.9
	RS3	20.4	16.7	no wind	W	0.0	3.2
	RS4	13.5	10.2	no wind	SE	0.0	7.9
	RS5	11.8	13.3	no wind	NE	0.0	4.5
	RS6	13.8	12.9	NW	NW	0.1	3.1
	RS7	23.3	14.6	no wind	SW	0.0	5.6
	RS8	15.2	16.6	SE	N	0.4	5.4
	RS9	16.1	21.8	no wind	NE	0.0	15.0

Table 3: Microclimate in Rotherham Street on the days of fieldwork and acquired from NIWA weather station.

Days when the higher temperatures have been registered at NIWA were sunny days when the NIWA equipment was exposed to the sun and to the wind, and my weather station was placed in the shade and protected from the wind. The warmest temperatures registered on the case study site were in the afternoon, when the sun reaches the east side of the street. In Rotherham Street comfortable conditions regarding microclimate could be achieved by increasing the maximum temperature on site in days when the maximum is still too low (RS4, RS5 and RS6, for example).

Rotherham Street seemed to be a passage place on colder days, and a congregation space in warmer days. When there is prevailing easterly winds, "*the façade facing east is less protected than the façade facing west*" (field journal, 17 July 2012), and during the fieldwork it was noticeable that in northerly wind days the east side of the street is more used. In the afternoon the open area of the café located in the east side of the street – facing west – is busier than the one across the street. The main reason is clearly the microclimate generated by the combination of wind protection and sun exposure during in the afternoon.

A different phenomenon was noticed during the cold season. During a day (RS3) when the Kyle Street Weather Station registered 11°-12°C at 10am and the research weather station registered 14.4°C there were many users of this site in short sleeves (field journal, 24 April 2012). It was a sunny day with no wind, resulting in a very pleasant day. The fact people prepare to be in the indoor environment of the mall, however, affects how they use the open areas adjacent to the mall, as they

[27] The days are presented following a code with the initials of their case study title to facilitate referring back to them. The other sites will follow the same logic: WC for Windmill Centre, CM for Cashel Mall, and SC for South Colombo Street.

can use lighter clothes and handle the short period spent outside, but they would be unprepared if the outdoor microclimate was pleasant but not warm. Towards spring the users of this space seemed to use lighter clothes than in other sites. This is also defined by the temperature inside of the mall and surrounding establishments. And indeed, the research weather station has an indoor and an outdoor monitor, in certain circumstances the difference between these temperatures was over 17°C (27°C inside and 10°C outside at 11am on 17 July – RS4). Despite being good to provide appropriate levels of thermal comfort in indoors environments, the preparation to be inside hinders the use of open areas surrounding these very controlled environments.

Rotherham Street is an urban social space located in a north-south oriented street. This street is largely protected from easterly winds but is also largely shaded receiving sunlight for only a couple of hours in the afternoon. In this research it added the dimension of 'normality' as it has been minimally affected by the earthquakes and carried on as a normal city setting despite being in a city undergoing major changes. The intervention of blankets put in Coffee Culture also added interesting insights on how much different people and groups are willing to adapt to the climate and what makes them take action. The next section presents the second building-defined street, located this time in an emerging urban setting.

1.2. Cashel Mall and Humming Bird Café

The Re:START container mall in Cashel Mall is constituted of colourful easily movable and frequently changing modules formed by shipping containers which are the main feature of this site. The constant reorganisation of space was an attraction in itself as these site's changes affect the experience of the urban landscape and urban comfort. Every day of fieldwork noted some change, such as rearranged containers (field journal, 22 June 2012), new market areas (field journal, 17 August 2012), establishments that are open or closed as well as installation of short term containers to host groups of researchers working on the area (field journal, 24 May and 14 November 2012) and so forth. These changes made it clear how favourite spots, and consequently the open spaces use pattern, were influenced by the changes in the urban landscape.

Figure 28: Cashel Mall (sketch by author)

The new Cashel Mall is also an urban social setting as it is a place to be among others, many people go in groups, and is a place usually referred to as a place for meetings. The users of the area are varied regarding age, activity[28] and lifestyle. The number of men and women in the site was balanced, but *"this site was not the easiest to interview middle-age men"* (field journal, 17 May 2012). Most men, who are from Christchurch and use the area, especially during week days, were in work breaks and did not have time to participate in this research.

> *"I talked to a man who lived in Christchurch 40 years ago. He couldn't participate because he has been living in Melbourne ever since and the last time he had been here was in 2005. Then I tried two others, one was from Paris and has been in Christchurch for three days and the other was from Holland and has been here for four days. These are the ones who would have time but could not participate because did not fit the interviewees profile. I also approached a few others who were from Christchurch but didn't have time."* (Field journal, 17 May 2012)

[28] Activity here refers to work activity such as business people, civil construction workers, retailers and so forth.

Figure 29: Humming Bird Café

The supporting café in Cashel Mall was the Humming Bird (Figure 29), and in Cashel Mall – both in the café and on the street – 27 individuals of varied ages were interviewed. The predominant users of the space at the time of fieldwork were young adults, also mostly women. Users of the area vary throughout the days and also in different times of the year. In days with stable weather conditions, the public that use the area can be divided in three main distinct times:

1. **Before 10am**: When Ballantynes is open and before the Re:START stores open – Ballantynes opens at 9am and *"the first users of the area are usually elderly women and couples, and women with young children"* (field journal, 17 May 2012). This is also the time of the day where the tradesmen dealing with street and building repairs are in larger number and can be easily identified.
2. **From 10am to 1.30pm**: The second group comes around 10-10.30am for coffee breaks – at morning tea time – and some are focused on shopping. This second group also adds adults that work in the area who are mostly business people and civil construction workers. The first use the area of the cafés for *"business meetings at morning tea or lunch time"* (field

journal, 24 May 2012 and 12 December 2012), and the second use the public benches for coffee and lunch breaks. At this time, especially in warmer days, buskers and young adults who come to Cashel Mall for shopping are also frequently seen in the area. At lunch time, on Fridays the stage in Zone 2 (see Figure 30) is used for informal music presentations.

3. **After 1.30pm**: The third group comes after lunch time and has an increasing number of Asians and school teenagers after school hours.

Some variations – that add to the daily patterns of use of the space – were also identified throughout the year, in three main periods:

1. **Before winter:** These were quiet months. In this period many researchers from local Universities, media people and locals were identified. The characteristics of place users – being mostly locals – made it easy to recruit interviewees.

> *"Today I interviewed four people and participated in three different researches. The first was about the 3D device from the University of Canterbury – CityViewAR; the second was at the University of Canterbury research container, where I described what I felt in the February earthquake in Portuguese and English; and then I was approached when making the last field notes for the day, in the third case two guys approached me to show the song they are making to the Cathedral and ask for my perceptions."* (Field journal, 17 May 2012)

2. **Winter:** Many locals and families. Increased number of children and teenagers during school holidays.
3. **Spring and Summer:** The period after winter was the time for tourists. *"Cruise ships arrived in Lyttelton and Akaroa"* (field journal 23 October 2012) during spring bringing many tourists into the central city. At this stage more establishments had reopened in the surroundings of Cashel Mall, and so there were more varied attractions in the area. During spring time the *"tourists have been usually in a larger number after lunch time"* (field journal, 14 November 2012), during the summer the place became mostly used by tourists especially during week days.

Besides these general patterns, some areas in this site were identified as having different types of users and varying throughout the year according to the rearrangements in the site. These changes were mainly addition or removal of containers and buildings. The satellite image below (Figure 30) shows the four main zones identified in this site.

Figure 30: Cashel Mall map with zones (base map source: Imagery ©2015 Google, Map data ©2015 Google, MapData Sciences Pty Ltd, PSMA)

The use patterns of the four main areas vary mostly regarding its users, but they also vary according to microclimate (especially zone 1). The zones can be described as follows:

- **Zone 1 – Demolition and sunny side:** This is the area close to the Bridge of Remembrance and the Avon River. It was a shaded area in the early days of fieldwork in this site as the two storey buildings shaded most of the street from early afternoon (as shown in the image above). This zone was quiet when the buildings were still standing, but *"after their demolition it became more open, sunny and popular as users of the space seem to be more dispersed because there are more sunny areas"* (field journal, 14 November 2012) (for changes on the urban landscape see Figure 11).
- **Zone 2 – Gathering:** Is where the larger congregations of people concentrate, especially because it contains a small food court and a café. The area is designed as an open and fluid area with a few sunny courtyards.
- **Zone 3 – Ballantynes area:** Area close to Colombo Street and the west limit of the red zone. Zone 3 is *"predominantly used by the employees of Ballantynes who use the benches in this area for their work breaks"* (field journal, 18 July 2012). They tend to come outside even when it is overcast or cold because they do not have access to daylight from inside the store. This area is frequently used by tourists especially when the demolitions of high rise buildings were under way.
- **Zone 4 – The new food court:** Although this area exists since Cashel Mall was reopened, a new food court was alocated in this zone in October 2012. It is a more informal eating area with a 'take-away character'. It tends to attract teenagers, young adults and a larger number of men over women (Figure 31d)

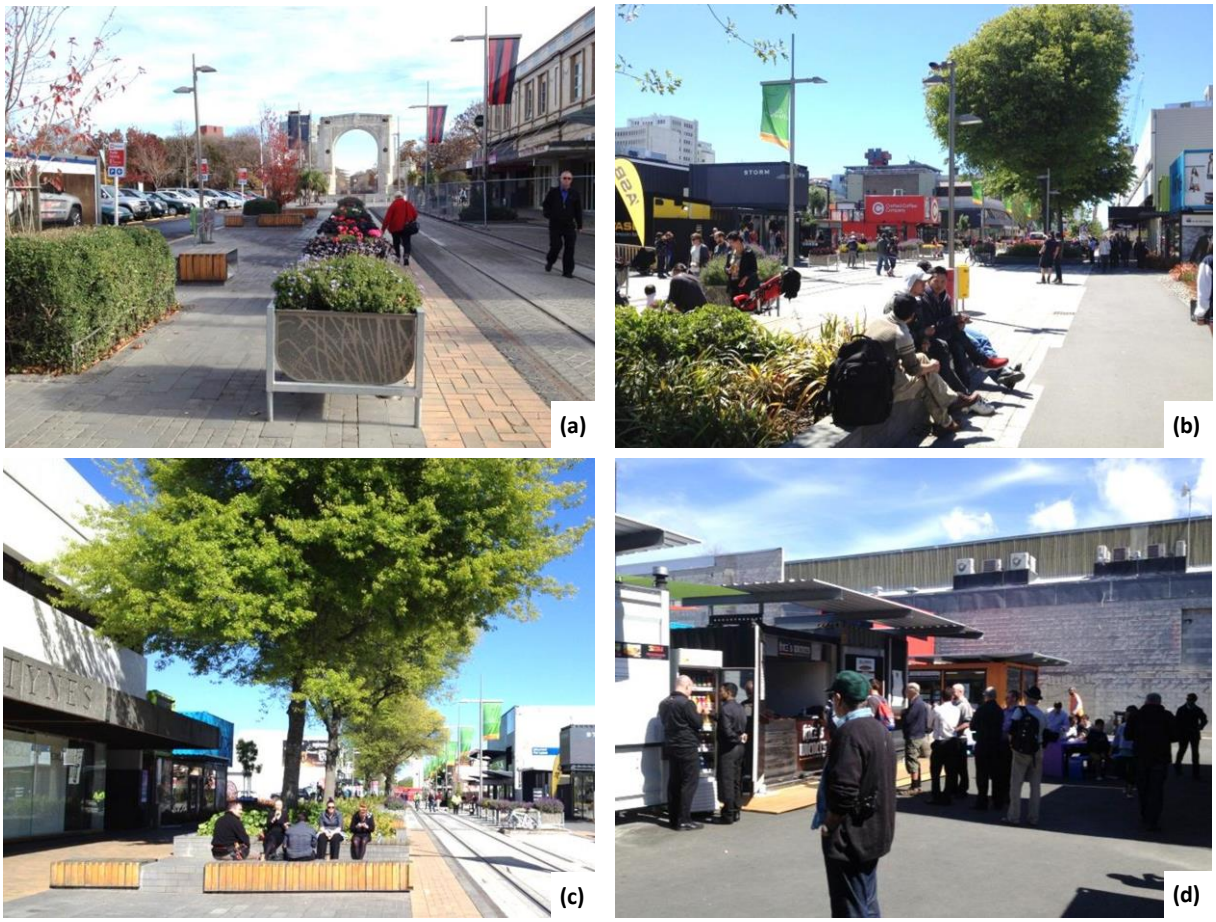


Figure 31: Cashel Mall zones: Zone 1 (a); Zone 2 (b); Zone 3 (c); Zone 4 (d)

In the early days of fieldwork – especially between May and August 2012 – the *"noise of the machinery of the street works and demolitions were very loud and the area look[ed] like a building site"* (field journal, 22 June 2012; Figure 32). At that stage the benches close to Colombo Street seemed to be the emptier ones as the noise and main demolitions were happening in that side. In this situation, because of the prevailing easterly winds and because of *"demolitions on the corner of Cashel Mall and Colombo Street, there is a cloud of dust in the air, and the Zone 3 remained empty for most of the day apart from a few people approaching the demolition sites to take photos"* (field journal 18 July 2012; Figure 32). During these days the time people stayed in the area was much shorter.

Figure 32: On-going changes on containers location (a) and (b), and demolitions on Zone 1 (c)

In cold days the area and benches located in the opposite side, close to Bridge of Remembrance (Zone 1), were damp for a large part of the day as they were shaded from two remaining two storey buildings (Figure 33).

> *"The benches closer to the Bridge of Remembrance are all wet and are still in the shade. There is nobody in that side and there is a perceptive difference on the environment of sunny and shaded areas. Looking at it I wonder if all Cashel Mall was damp like this before the earthquakes."* (Field journal, 24 May 2012)

Figure 33: Zone 1: the dampness (a) and the difference between sunny and shaded areas (b)

When the two storey buildings were being demolished some people started to shift to this side of the site as it provided a somehow unique experience considering the current stage of post-earthquake works (Figure 32c). In October the two storey buildings close to the Bridge of Remembrance had been completely demolished and at that stage the benches in Zone 3, close to Colombo Street, became predominantly used by Ballantynes employees as Zone 1 became a sunnier and popular area.

Also in early October *"a new food court was installed in Zone 4"* (field journal, 2 October 2012), and in November an area for a market was added (field journal, 14 November 2012). In this Transitional Project some unusual space use patterns – such as on-going demolitions and rearrangements of containers and space – had a large influence on the use and perception of the place as *"with so many changes people look for stores [and other establishments] they knew were there before"* (field notes, 17 August 2012). Especially during winter season, there were days when the area seemed like a building site with containers being moved around, new fences or pavement being added or removed and so forth. This type of day was more frequent during the winter because less people were in the area and the space was being (re)organised for the warmer peak seasons to come.

Being an east-west orientated street located in the east coast of New Zealand, this street is known for having a very unpleasant microclimate, especially pre-earthquake. The fact that the high-rise buildings in the surroundings and the buildings in the street have now been demolished made a significant difference in the local microclimate. Moreover in days with sunny mornings and windy afternoons it is noticeable the change in the use patterns of this site, as people disperse after a certain time to avoid the wind. An example of this phenomenon was a day when it became overcast and the wind increased (CM5 on Table 4), the temperature recorded in research weather station went from 19.4°C at 11.50am to 12.4°C at 2pm, and the patterns of use varied as described in the field journal (18 July 2012):

> *"**10:20 am:** Many people commenting that today is going to be a nice day… Indeed, it feels like it will.*
> ***12:30pm:** It is becoming overcast.*
> ***1:30pm:** The thermal sensation has changed drastically and some people start to demonstrate they are feeling cold – rubbing hands and crossing arms, for example.*
> ***2:15pm:** The sun is now gone, the wind increased and the temperature dropped. Today was a typical 'four seasons in a day'. People who were using the public benches disappeared, people eating were doing it quickly. The environment looks very different from the warm and sunny morning."*

(a) (b)

Figure 34: 18 July 2012 at 10:30am (a) and 2:40pm (b)

This type of change is not rare in Christchurch and is one of the main characteristics that attribute the *four seasons in a day* reputation of the city. On the other hand, when the sun is out, even for brief periods, the increasing number of users of public open spaces is easily noticed. But because Christchurch sun is very low in the winter (sun height is 23°), at that time of the year at 2.30pm the containers already add some shade to the area, and the remaining two storey buildings shade all the pedestrian space. In a space such as Cashel Mall the sun is a fundamental feature to be kept in place because the life of the urban space is highly dependent on the open areas, as a manager highlighted that *"[they] are like sailors in here, if the weather is bad [they] know it's not going to be that busy"* (M03). But if during the winter and colder days the sun is very welcome, during the warmer seasons the sun can also be a problem. New Zealand is very affected by the hole on the ozone layer over Antarctica (ENZ, 2013; Mullan et al., 2012) and therefore the sun can be very strong in mid-season and summer. For that reason, from early October, during the school holidays, *"many people started to look for shade, especially because of the children"* (field journal, 2 October 2012).

The location where I placed the weather station in Cashel Mall was a sunny spot unprotected from the winds. The microclimate measured on-site showed consistent higher temperatures and lower wind speeds than the data measured at NIWA. The only exception to this was CM4, a cold day with predominantly easterly winds, when the wind measured on site was more significant than the one measured at NIWA. Table 4 shows the comparison between these data.

Site	Day	max temp (°C)		wind direction		wind speed (Km/h)	
		on site	NIWA	on site	NIWA	on site	NIWA
Cashel Mall	**CM1**	17.5	15.9	NE	NW	0.3	3.5
	CM2[29]	21.9	7.5	NW	NW	0.4	2.8
	CM3	18.6	12.8	NE	NW	0.6	3.7
	CM4	12.9	7.1	NE	NW	3.0	1.7
	CM5	19.4	12.4	NE	S	0.8	3.0
	CM6	13.5	12.8	SW	SE	3.9	6.0
	CM7	24.3	14.6	NE	SW	3.5	6.6
	CM8	17.1	14.7	SW	SW	7.0	8.4
	CM9	21.3	16.6	NE	W	3.3	5.1
	CM10	23.3	22.2	NE	NW	3.7	6.6

Table 4: Microclimate in Cashel Mall on the days of fieldwork and acquired from NIWA weather station.

Another interesting aspect of the microclimate in Christchurch and which becomes very clear in Cashel Mall is the frequently mentioned wind chill effect (Honjo, 2009; Nikolopoulou, 2011). The lack of shelter on the street itself made the courtyards on Zones 2 and 4 very popular, as described by an interviewee who lives in a sheltered farm:

[29] CM2 temperature was also compared to the NIWA data collected at the Airport weather station. That alternative data was more similar to the one measured in Cashel Mall. This is a sign that something could be wrong with the NIWA measurement at Kyle Street. This was treated as an outlier.

> *"There's lots of shelter belts around the little farm… Then I parked in that car park by the end of Cashel Mall by the Bridge of Remembrance and walked up here and suddenly I'm a little bit cold. That east-west wind really... Apparently it's always the problem here… Yes, it's more sheltered [in the courtyard where we were]… But if you look at the flags [on the street]… (…)"* (E74)

According to the people I interviewed, the feature that makes the Re:START in Cashel Mall most appealing has been the way the containers create sheltered courtyards, with all day sun, and attractive planting and meeting areas. The questions that remain regard the rebuild and what can we learn from this transitional experience. Will the rebuilt Cashel Street be as attractive to people? Will there be equally sheltered, sunny and colourful courtyards in the new precincts and private developments? Have the designers and developers maximised on sun and shade and shelter?

The general patterns can be understood based upon the use of the space according to the time of the day, the time of the year and the zones. In addition to these major times and spaces there are also some events that change the character of the area, such as school holidays and festivals. School holidays, for instance, changes significantly the types of users, as *"there are more families, children and teenagers at those times of the year"* (field journal, 2 October 2012). Also during Christmas time the stores were open until 9pm and the decoration was all changed in February for the Chinese Festival.

In summary, in this site there were typical days when many researchers were working on site – when I answered three interviews in a single day, and when there were containers hosting research offices in the site. Then there were the days full of children and teenagers, during school holidays and the days full of tourists during spring and summer. The activity in the area exists under any type of weather as there are stores, cafés and restaurants in the area which work as magnets for activity. But although Cashel Mall is an urban social space, the condition of the place as a gathering area, is nonetheless highly influenced by the weather patterns. In cool days or even during the winter in 'nice sunny days' the place is well used, emphasising the importance of designing for the microclimate. The microclimate effect was also highlighted after the demolition of the two storey buildings in Zone 1. After those demolitions the pattern of use of the space became more dispersed, as there is now a more extensive area exposed to the sun.

2. URBAN RETREAT SPACES

When looking for a peaceful and quiet experience, the relationship between the user and the place is different from the previous presented urban social spaces. The expectations of a 'more perfect' thermal comfort are higher when the main attraction is the place itself. For this reason the influence

of microclimate on the patterns of use proved to be more significant in urban retreat spaces than in urban social spaces.

> *"It really depends… If I am by myself, I quite like having my own quiet space, but if I am out with people, with friends or colleagues or anything, then we generally go to more people oriented places, you know… Where you can have a good time and talk to new people, and meet people and that sort of thing. But when I am by myself it's just generally really to hang out by myself…"* (E35)

The smaller, people-based scale also had implications for the fieldwork. In contrast to the urban social settings where the urban life is based upon many different points of attraction throughout the site, in the urban retreat space this activity is more concentrated. The establishments where I placed the weather station were the main focal points of the area. This difference in the structure of the sites implied a different method for observing the events (as explained in Chapter Three).

2.1. Windmill Centre and Ed Hopper Café and Bookshop

Ironically, although the commercial centre is called *Windmill*, this is the least windy of the four sites. The site faces north and is protected from the easterly winds, and therefore the microclimate in this area tends to be very benign and a good feature of the space, which faces a parking area (Figure 35 and Figure 36). For this reason, in the Windmill Centre the microclimate proved to be a main feature in a large number of days, as a respondent described his choice for Ed Hopper café:

> *"I have been here before and it can get hot because it is quite sheltered from the winds, so I knew this little area is quite warm, and I knew I could come here and I would be alright."* (E26)

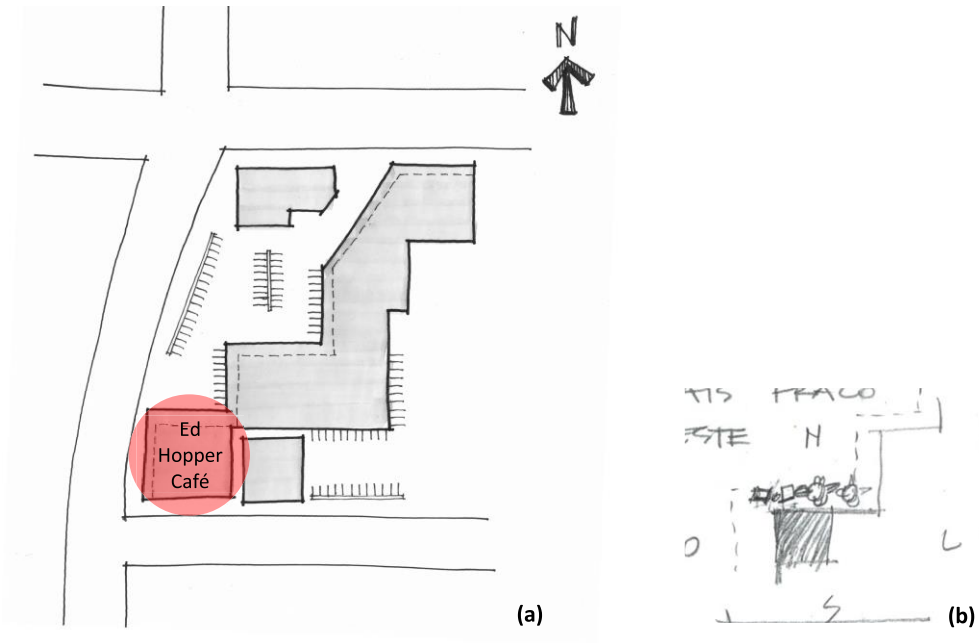


Figure 35: Plan of Windmill Centre Commercial Centre (a); based upon from field sketches (b) (sketches by author)

The fieldwork in this site started concurrently to Rotherham Street, during the pilot study in October 2011. In this site the parking area has very little greenery and is predominantly a hard landscape (Figure 36). It has just one public bench in the opposite side of the car park, and although it is adjacent to a busy street, its design creates the impression that the establishments are further away from street traffic than they are in reality (see Figure 39).

Figure 36: Windmill Centre viewed from across the street (sketch by author)

Windmill Centre and Ed Hopper Café are a more client-based area than Westfield Riccarton located just one block away, and for that reason it offers a very different experience and consequently attracts a different clientele. The café has a small outdoor area with three (autumn and winter) or four (spring and summer) tables outside (Figure 37). The café was renovated in January 2012 and some changes in the use pattern of the area were noticed. Before the renovation the establishment specialized in technical books and had a small café area, now it is a café with some specialized books. *"The indoor space changed and so changed the public, people still don't stay outside in very cold or very hot days"* (field journal, 14 September 2012 – notes on conversation with manager).

Figure 37: Windmill Centre and Ed Hopper Café (sketch by author)

While Rotherham Street attracts more teenagers and young adults during the day, Windmill Centre is a place for people of more mature age. It is unusual to see youth in this site – fact reflected in the profile of the respondents of the interviews – and the types of users are mostly women and men adult to elderly and more women than men in adult age. The open space of the café was *"predominantly used by men, people waiting for friends – who go inside when the friends arrive – and customers waiting for drinks to take away"* (field journal, 2 May, 2012).

Regarding the use patterns of the case study sites, an interesting difference between this site and the urban social spaces is that, instead of getting busier during school holidays, it becomes quieter. The main users of the space are business people who tend to take these weeks off from work to stay with the children. The type of users is mostly consistent throughout the year, but varying according to school holidays.

> *"Certainly it has been a bit quiet. [During] school holidays generally a lot of the business people in the area take the family to spend time with the children. So it can be a bit quieter during the school holidays. A lot of our customers either go skiing, Gold Coast or Fiji."* (M02)

The interviewees from the Windmill Centre included 15 individuals, mainly adults. Customers tend to choose to be in the open area because of its microclimate, and in a general sense, the use pattern of this site is divided in four main distinct times:

1. **Before 10am**: The street is predominantly used by cars and not many pedestrians are seen in the area. The commercial centre works as a service place as people constantly drive their cars in and out. The site is quiet and most customers are business people buying drinks to take away and elderly people who tend to stay inside.
2. **From 10am to 11.30pm**: Number of people walking in the street increases. In the commercial centre *"the number of people also increases because the restaurants and eating places start to prepare for lunch time"* (field journal, 4 May 2012). There are many Asian restaurants in the area and *"the customers of the commercial area are predominantly Asians and women using the café and the hairdresser next door"* (field journal, 25 September 2012). In the café, groups start to arrive and *"more people sit outside in sunny days"* (field journal, 16 October 2012). It is also common to see people using the café space for business meetings in the morning and lunch time – in one specific day I saw at least three groups with documents discussing business in the morning.
3. **From 11.30pm to 1.30pm:** Lunch time is the busiest time in the commercial centre, as it has many restaurants, including the café. *"The number of men – especially business men – in the site increases, and in nice days most men tend to look for tables outside"* (field journal, 4 May 2012).

4. **After 1pm**: After lunch time the number of people in the street is still considerably high – higher than early morning – but *"the number of people in the commercial centre and in the café starts to decrease"* (field journal, 10 July 2012).

When I started the investigation in this site, in spring 2011, the number of women and men seemed to be balanced, but during winter time the number of women clearly exceeded men. In a cold day in May I noted *"there were 21 women and no men at lunch time"* (field journal, 2 May 2012). A possible reason for this is that men are the predominant users of the outdoor area of this café and in cold seasons they tend not to come. In these cold days the outdoor area assumed a character of a waiting area where it was just used by people waiting for friends or drinks to take away.

The site itself is busy during lunch time due to the Asian restaurants and the café. At this time most of the car park of the commercial centre is full. Besides that time, throughout the day most of the area is reasonably quiet. *"Many people walk around using Windmill Centre as a shortcut"* (field journal, 27 July 2012 – Figure 38b). Some people come from the offices around and buy drinks to take away.

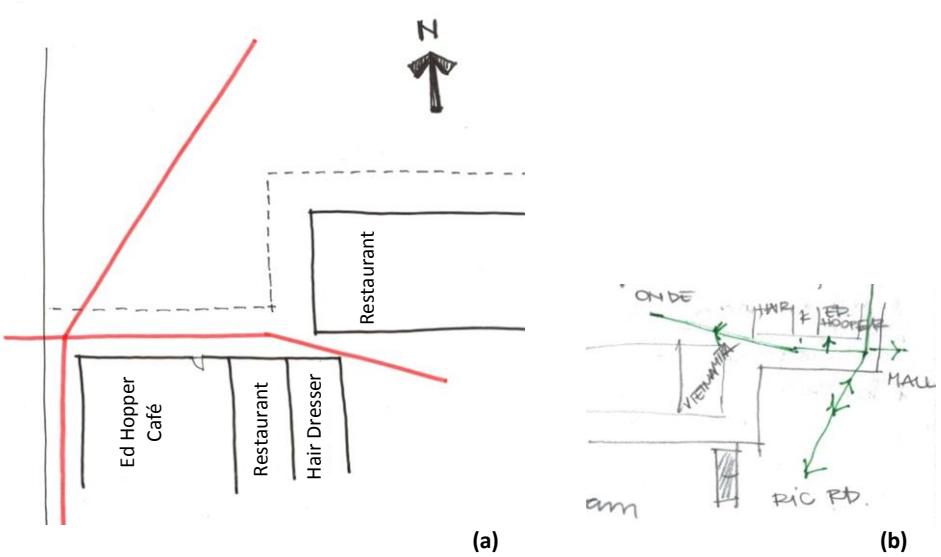


Figure 38: Predominant movement lines (a), based upon field journal sketch (b)

In this site the use of the open areas is affected by the proximity to the cars. The open area of the café is especially affected as it is adjacent to the main entrance of the car park. Cars arriving and leaving the car park get very close to people in the open area (see Figure 37), generating a *"feeling of insecurity frequently mentioned by interviewees"* (field journal, 29 March, 2012): *"It doesn't feel as safe. I mean even here in the car park with cars around, it doesn't feel as safe as it could if it was separated off a bit* (E19)*."*

Figure 39: Ed Hopper Café and Bookshop outdoor area, looking east (a) and west (b); and the carpark in front of the north façade (c)

On the other hand, although it is located by the side of Clarence Street which has a heavy traffic of cars, buses and trucks, it feels like a quieter environment because of the design of the setting, "*you kind of don't really notice when you are zoned out outside"* (E25). Although it is more a perception than a reality, this highlights the importance of planning the space to achieve an aimed atmosphere, in this case a more peaceful one despite being close to a busy street. This provides a more quiet and relaxed atmosphere, which along with the microclimate seem to be the biggest attractions of this place, as a key informant pointed out:

> *"One of our customers suggested going down the road side, but it would be quite noisy and you get that little bit of wind and it was a lot colder. And you also have the traffic on that side. That is not what we want here."* (M02)

Ed Hopper Café and Bookshop underwent a renovation in January 2012, when the interior space was redecorated, the book section became smaller and the range of alcoholic beverages options increased.

> *"We had alcohol in here as well, but it just wasn't emphasized so much. And because we only had about six bottles up there, not many people would come here and have wine. Men may have a wine and the lady would have a coffee at lunch time."* (M05)

Also on the topic of the renovation they pointed out that:

> *"… People are coming more regularly now because it's more like a café than it was before with the bookshop. So before was more like a small café with a bigger bookshop, now it's a small bookshop with a bigger café. Customers are basically the same, same demographic, probably a few younger ones coming in perhaps."* (M02)

Latham (2003, p. 1709) has pointed out that "colonial New Zealand saw the formation of a male public culture organised around a deep antagonism towards both women and the feminine". The urban life in the country still carries the remains of the dominant male culture of the 1890s, which has been changed to an extent through alcohol control in public establishments. The remains of this culture are clear in this café, where alcohol is sold but the public is largely women. The reason a manager highlighted is that the atmosphere is different from a pub, so the *"women can have their wine in peace and not be bothered by drunk men"* (M05):

> *"Our customers are now more women than men. Business men are the ones that come here and tend to come more during the day. We always have groups of women that come here later in the evening. They prefer because they say there is less men around…"* (M05)

In another interview, in a different setting – in South Colombo Street presented in the next section – I mentioned that Windmill Centre and Ed Hopper were one of my sites and the interviewee replied that he rather go to the South Colombo Street site, which is more open, because Ed Hopper Café "*is a more feminine place and if at lunch time I was by myself I'd rather go to a pub"* (E79). When I mentioned that the character of the place seems to have changed after the renovation, they replied: "*Before was more focused on technical books and was messier, now it is more organised and feminine"* (E79). The use patterns and public types identified in this site demonstrate how the local culture described by Latham (2003) is expressed in New Zealand's contemporary society.

The pleasant ambience, the music and the decoration of the renovated space are attractions to be indoors and these features of the space do not extend to the outdoor area. But regarding the attractions of the open space, the most important feature of this area seems to be its microclimate. The landscape-based street is a commercial centre and does not attract many people to linger. The only outdoor area for lingering is therefore the café area. In some overcast busy days (inside) the managers place the outdoor tables indoor, as that is the choice of most customers. In this types of day *"most people outside are waiting for friends or drinks to take away"* (field journal, 2 May 2012).

The overhead protection is not large and in mid-season and summer it protects at least up to the height of the head of a seated person, especially in the afternoon (Figure 40d and Figure 40e). The area is exposed to sun from 9:30am during the winter and from 12pm during summer Figure 40a). This makes the setting great during mid-season when the temperatures in Christchurch are not too

high and the sun is not too strong, but in summer time *"the overexposure to the sun can make the place also unpleasant, people don't seem to stay outside because of the sun"* (field journal, 5 December 2012 – Figure 40b). During winter it is also very sunny, although the low sun reaches the face of customers and it can be uncomfortable at certain times (field journal, 4 May 2012 – Figure 40c). The managers put some tables closer to the car park, in a way that the person seated would be more exposed to the sun, but many – if not most – customers bring the tables back so their bodies are in the sun, but their faces are protected.

> *"[This place] is a bit non descriptive, sort of slightly featureless. All these single storey buildings without any great architecture (…). [But] I walked pass this café a few times and I always thought it looked nice… But I'm sitting out here because it's sunny and*

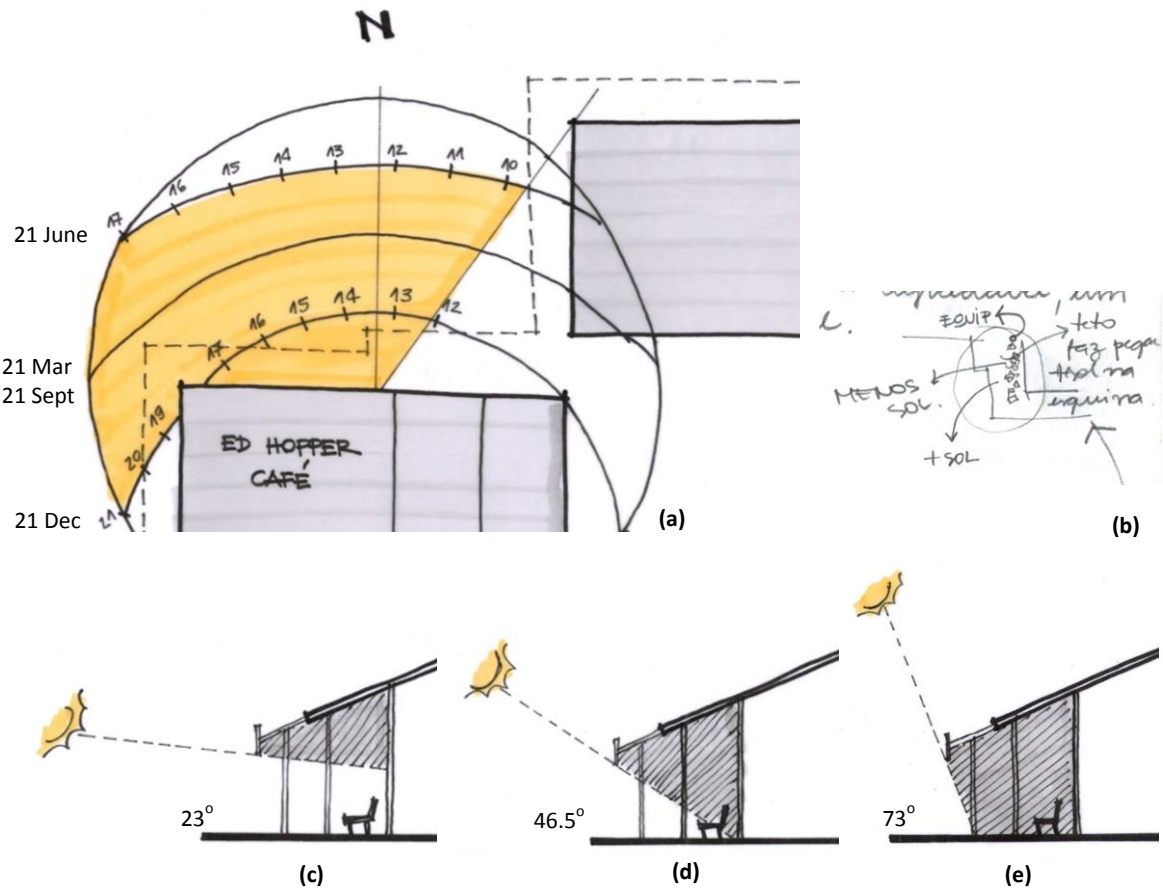


Figure 40: Sun path in Windmill Centre (a), based upon field sketch for identification of sunny spots (b); winter shade (c); mid-season shade (d); summer shade (e)

In Windmill Centre the weather station was located very close to the people seated in the outdoor area of Ed Hopper Café. It was so close to where customers were seated that the microclimate measured was absolutely the same they were experiencing. It was in general sunny spot (on sunny days) and mostly protected from the winds, especially the easterlies.

The comparison between the average microclimatic variables measured on-site and the ones downloaded from NIWA's CliFlo are evidence of the successful microclimatic design of this small open area. This was the main reason to have the weather station as part of this research. Because of the low humidity in Christchurch the air temperature combined with the radiant temperature makes the microclimate in a protected place very different from the general climate for the city.

The microclimate measured on-site shows consistently and considerably higher temperatures and lower wind speeds than the data measured by NIWA (with the exception of WC1). Table 5 shows the data from both weather stations. It is particularly interesting to compare the data measured on-site from May to October 2012 (WC5 to WC9). In this period the data measured on-site was on average 10.5°C higher than the NIWA measured, and on the specific WC7 it reached 15.4°C higher than the general climate measured by NIWA.

Site	Day	max temp (°C)		wind direction		wind speed (Km/h)	
		on site	NIWA	on site	NIWA	on site	NIWA
Windmill Centre	**WC1**	18.4	20.9	SW	SW	0.3	5.3
	WC2	21.9	19.2	SW	SW	0.6	7.2
	WC3	20.9	17.0	NW	NW	1.7	4.3
	WC4	25.1	22.3	SW	NW	0.8	3.9
	WC5	28.3	15.2	W	W	0.1	3.4
	WC6	21.8	13.0	no wind	SW	0.0	2.0
	WC7	24.4	9.0	W	NW	0.7	2.4
	WC8	21.3	12.4	NW	NE	2.5	10.0
	WC9	20.1	14.0	SW	S	0.6	7.1
	WC10	30.6	20.3	NW	NE	3.2	12.7

Table 5: Microclimate in Windmill Centre on the days of fieldwork and acquired from NIWA weather station.

The effect of the cool wind common in Christchurch, however, is hardly expressed by the numbers above. On both WC2 and WC3 the data recorded by the weather station have not registered temperatures below 14°C. Still, the users of the open space complained about the cold weather. Along with this observation some interviewees blamed the constant windchill in Christchurch for these cold days, these interviewees in most cases said to be cold because of the breeze or wind, many times in days with barely any wind. Windchill is applied for a minimum wind speed of 4.8 km/h (or 3m/s) (Heidorn, 2001), but it has been highlighted that places for lingering and focused on providing outdoor thermal comfort should be designed to maximise sunlight and ensure wind speed stays below 2.5 m/s (Tacken, 1989; Walton et al., 2007). Moreover the effect of sunlight is not limited to the thermal sensation:

> In winter it may produce specific pleasure. On a hot summer day it may produce specific discomfort, beyond the heat sensation. In un-shaded areas pedestrians may also be exposed to surface temperatures much higher in summer and lower in winter than the ambient air temperature. (Givoni et al., 2003, p. 78)

In Christchurch, however, this undesirable thermal sensation is not only limited to summer, as a situation occurred on WC5 demonstrated. On that day, at around 10:40am the setting was *"getting warmer and the climate was certainly an attractive factor"* (field journal, 4 May 2012). But not long after that time it seemed to have crossed the line of comfort limits in the sunny area, protected from breeze and winds, it became too sunny and hot. With these conditions customers of the café who were outside reported they feel uncomfortable because of the sun, so they went inside and moved to the back of the café to avoid the sun coming in through the window. In this same day around 2:30-3pm the sunny area became undesirable, as the temperature in the area reached 25°C at 2.30pm and 28.3°C at 3pm, while the Kyle Street Weather Station recorded a higher of 15°C at 3pm on this same day (see Table 5 above).

The description of this day raises the question; to what extent do we need the sun in colder days? In a general sense, for a location as south as Christchurch, with a temperate climate, it is easily assumed that in days with a maximum of 14°C sunny spots would be very pleasant, but the behaviour of users highlights that when the wind and breeze are controlled, the insolation also has to be carefully planned.

During the fieldwork it was clear that some tables were used more than others. My first impression was that one of the tables was less used because of its proximity to the street traffic. However, there was a difference between the sun reaching that table and the others. This difference was due to a cut in the overhead protection making the corner shorter than the rest of the roof. Therefore the table close to the street is more exposed and the sun reaches the customers face easier than in the other tables (field journal, 21 March 2012).

> *"It is really nice inside, I would stay in, but the fact that was sunny, and also the fact that my face is not going to be in the sun, so I'm in the sun, but my face is in the shade… It's really good."* (E64)

In the early stages of the fieldwork I had more interviews completed and there were more people outside in cool spring days. In some cases the breeze improved the thermal sensation, as the sun was too hot and burning. Hence it seems that *"there is a certain combination of sun and temperature that attract people to be outside in this area, it has to be enough sun – but not too much – and it can't be too hot or too cold… It has to be just right"* (M05). In many spring days the area was very pleasant, but in some of them it became overheated.

Regarding the use of the open space of the Windmill Centre this site adapts its outdoor during the year. The major changes can be described according to the seasons:

- **Winter**: During the cold season *"the outdoor table and the chairs usually located close to the street are placed inside"* (field journal, 10 July 2012). Ironically that is the one that gets more sun and also, when I first noticed this change it was a day (WC6) that at 1pm this research's weather station registered 24.4°C at the same time that Kyle Weather Station registered 9.6°C.
- **Spring and autumn**: Another seasonal change was the *"addition of umbrellas on some of the tables during spring"* (field journal, 16 October 2012). This makes the place more shaded, 'extending' the overhead protection. Despite serving its purpose, *"some people move the tables closer to the façade, to the better protected area"* (field journal, 16 October 2012). A number of interviewees pointed out that autumn is the best season in Christchurch regarding weather conditions and others highlighted that spring tends to be windy, but the public open spaces seem to be more largely used during spring time. A possible explanation is that spring carries a dimension of tiredness from the cold winter days, while in autumn the perception is different because of the precedent warmer summer days (Pungas et al., 2005).
- **Summer**: During the warmer season an *"extra table is added outside, making it five"* (field journal, 5 December 2012). Christchurch's summer days frequently have a prevailing nor'wester wind, which is very different from the easterly winds common during most of the year. This specific site is not protected from the nor'wester winds, but they also do not seem to prevent the use of the open areas. In days with the prevailing nor'wester winds, *"the umbrellas are inefficient because of the risk offered to pedestrian and traffic, so they remain folded"* (field journal, 5 December 2012).

In this setting the main three elements of design to achieve a successful and 'alive' space in the outdoor area are sun, wind and perceived security related to cars. The type of place and what is offered around this destination is also an important feature of this site. The adjacent attractions have influence on the chance to perceive and adapt to the climate.

> *"Maybe the sort of place – and what it offers around the destination – has an influence on the chance to perceive/adapt to the climate. People that go to Ed Hopper go to the café and park the car close to the place. If they were in the street – walking, biking, etc. – the chances of perceiving that the climate there is good are larger. What is 'known' – because it is winter – and 'perceived' – because it is a warm winter day – are different. In this sense, having a more 'vibrant' place, where things happen, seems to give people the chance to adapt."* (Field journal, 10 July 2012)

In other words, the space outside the café is a great one in terms of microclimate, but customers that go to the café in Windmill Centre, park the car close to the place and tend to go inside if it is a cold season. Moreover, increase in the space's greenery would certainly be welcome by many customers who mentioned that it would make the space more attractive. Greenery could be used in a strategic

way to provide a perception of protection from the traffic coming in and going out, with planters for example.

Finally, Windmill Centre added important insights on how significant the result can be when designing with microclimate. Another lesson from Windmill Centre is the importance of giving the users of the space a chance to perceive the microclimate. In other words, as Givoni et al. (2003) pointed out, when a person is staying indoors their subjective reactions to climate variables are independent of the conditions prevailing outdoors. Therefore, the users of the microclimate amended areas need a chance of realising that what is known ('it is winter') and what is experienced in a specific amended microclimatic area ('it is warm here') can be different. Ideally the microclimate amended areas should provide people with a chance of feeling this difference, and this might mean spending a few minutes in the street before making the decision of being indoors. Having a more vibrant place, where there are things happening – such as Cashel Mall and Rotherham Street – provides the chance of experiencing the microclimate and therefore adapting. Thus the 'experienced microclimate' is a dimension of adaptation that can be influenced by urban landscape design. Windmill Centre provides a great microclimate but not many chances of perceiving it before making a decision of being inside or outside. Most new customers will simply park the car outside the door and walk in, not realising the amended thermal environment.

2.2. South Colombo Street and Coffee Zone

The café where the equipment for this research was placed in the days of fieldwork is located in a kiosk built with old wood and decorated with Lego. The surrounding garden area, including a gazebo, was built using pallets. This site is part of a temporary project, but has similarities to the Windmill Centre as it is generally used by individuals or small groups and is a relaxed, client-based area.

> *"The purpose of this space is twofold. It is to sell coffee but also to be a focal point to come to and enjoy the broken ground and the broken streetscape. To see that now there is something bright and pleasant and green that encourages people to stop for a moment and reflect on where we were and where we can go in the future."* (M07)

Figure 41: Coffee Zone area (sketch by author)

The area in front of the kiosk faces west and is adjacent to the footpath, therefore close to the traffic. The gazebo in the back of the kiosk (Figure 42 and Figure 43) is mostly used at lunch time by people that bring their lunch from home and for business meetings, especially from the employees of the bank located across the street. The gazebo is a protected area that receives sun from the north, therefore during most of the day.

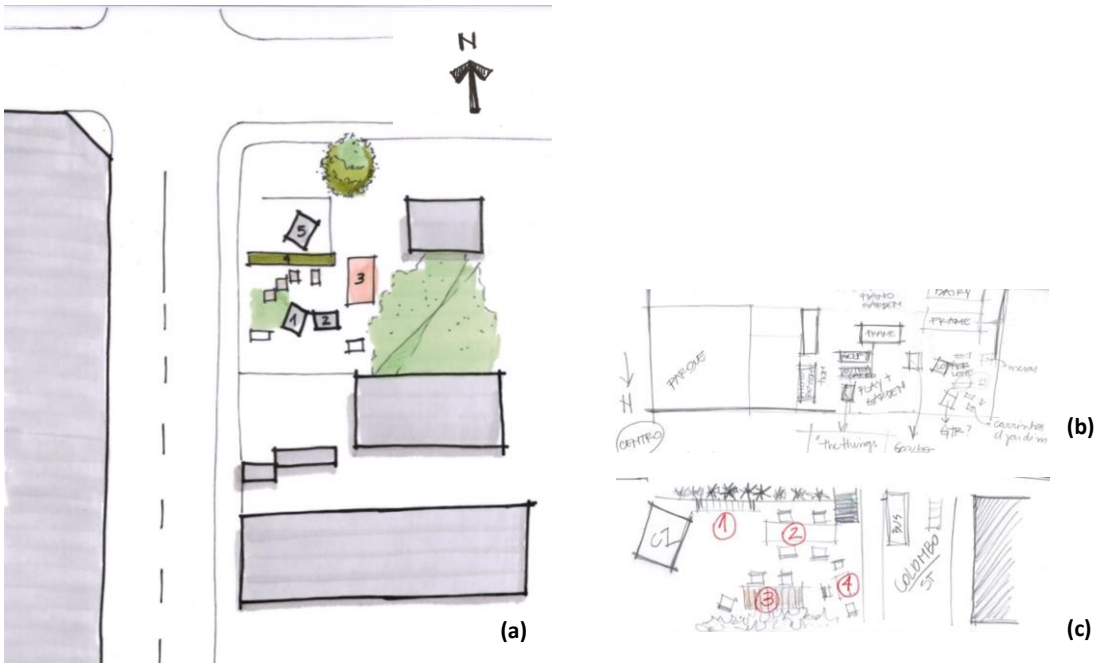


Figure 42: South Colombo Street site on plan (a) (1. Coffee Zone, 2. Gazebo, 3. Playground, 4. Mini-golf, 5. Gap Filler office); consolidated from field sketches (b) and (c).

This establishment is very client-based, where *"the staff know customers by their first names and frequently guess what they will order"* (field journal, 29 October 2012). The owners are frequently working in the site early in the morning and at the closing time. One of them works in the café until 11am – while it is busier – after that there is just one employee serving customers. The *"'see you tomorrow' generally said by many customers when leaving"* (field journal, 8 November 2012) is illustrative of the close connections between staff and customers.

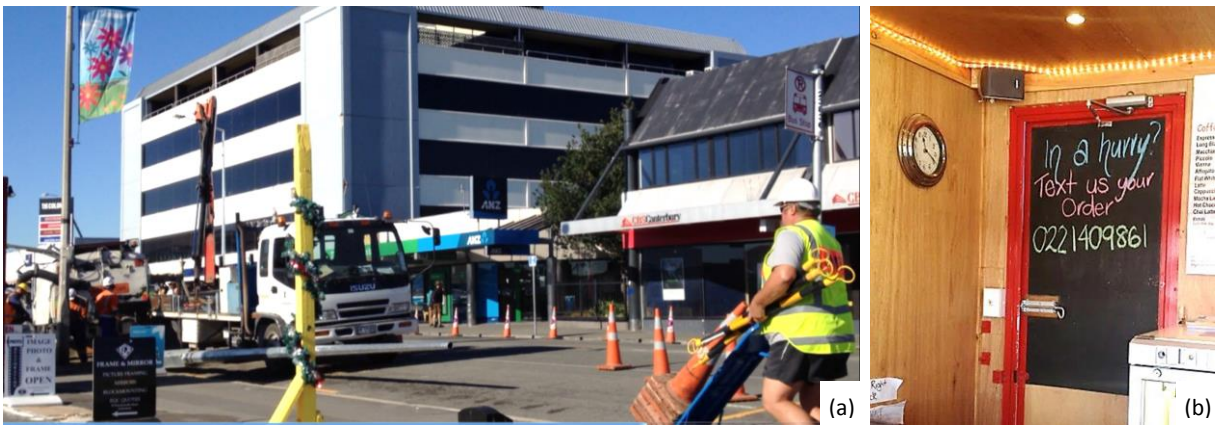
Figure 43: Coffee Zone and its relaxed atmosphere

The main users of this setting are business people and people that work around the area. The site is sometimes also used by *"women with small children [because of] the playground area"* (field journal, 8 November 2012). Some customers are frequent users of the café which has around four or five customers that go there every day and sit down for half an hour or more while reading newspapers or books. The old fashion way of *"writing expenses in a notebook is still kept in this café"* (field journal, 8 November 2012) and is available for these loyal customers.

As South Colombo Street was the last site to be added to this fieldwork, the study on-site was carried out for a shorter time and for this reason had fewer interviewees. In total, 11 interviews were carried out in this site, the vast majority of users of the site are adults and not many teenagers use the area. The environment is very different from Rotherham Street and Cashel Mall. The ages are *"predominantly from young adults to mid-age men and women, and elderly men"* (field journal, 29 October 2012). Women are not seen frequently by themselves and they just use the site if they are in a short wait for their drinks to take away, but they *"don't tend to go to the space with the purpose of enjoying the environment"* (field journal, 10 December 2012).

Figure 44: Relationship between the Coffee Zone site and South Colombo Street facing south (sketch by author)

Because this is also a temporary site surrounded by semi-empty demolition sites, as in Cashel Mall in some fieldwork days *"the nature of this site was that of a buildings site"* (field journal, 31 January 2013, Figure 45a). The dynamics of this site is mostly guided by the café hours and customers. An interesting service that helps to define how the place is used is that the drinks can be ordered via SMS (Figure 45b), therefore reducing the time the customers stay in the site.



(a) (b)

Figure 45: The building site nature of the case study site (a) and evidence of its take-away approach (b)

Due to its take-away character the use patterns of the place tend to be highly variable, but in a general sense can be summarised in three distinct periods throughout the day:

1. **From 7am to 11am:** These are the busier hours where the majority of customers are business people on their way to work and people that work in the area who come for their morning tea. During this period of the day sometimes *"the area gets empty and suddenly many groups arrive together"* (field journal, 31 January 2013). It is also mainly in the morning that the site, especially *"the gazebo is used by employees of establishments in the*

surrounding area – such as banks – for business meetings" (field journal, 2 November 2012 – a day when 3 different groups used the gazebo for meetings). *"Between 10 and 11am is the time when more people tend to linger and use the tables to have their drinks and snacks"* (field journal, 14 February 2013).

2. **From 11am to 1pm**: Reasonably quiet in the café area. Some people bring their lunch and use the gazebo and the picnic table in the back of the site.
3. **After 1pm**: Very quiet time with just a few customers using the area. The clientele at this time is different again. Business people still use the space, but very less frequent than during the morning, and there are also *"couples and passers-by that stop for drinks or just to enjoy the area"*. Also during the *"afternoons is common to see more women around than in the mornings"* (field journal, 15 February 2013).

The site also has a playground, a picnic table and the gazebo, the use of these facilities is more dependent on the climate than the success of the establishment itself. Moreover during some times of the day the area becomes a congregation of people that are not necessarily focused on the café itself.

> *"Most people as far as coffee consumers, would be just in and out, so we have some people that come to drink coffee and they just park and come to get the coffee. [But] majority of the other people who come here are people that just come to enjoy the space, and they come and sit on the table and read the paper, wait for the bus, have their lunch here…. They don't even buy a coffee, so it works like it's an open public space. People come and ask if it's ok for them to stay here because they are not going to buy a coffee, and I always say they are welcome. It's really nice."* (M07)

There is predominance of *"businesses and workers, who come to buy a drink and go back to work"*, or in other cases when people tend to *"buy two or three drinks to the colleagues that are waiting for it made difficult to do interviews"* in this site (field journal, 14 February 2013). For this reason, it was more difficult in this site than in the urban social settings or in Windmill Centre, where the open area, even though it is small, is in most days an area for lingering.

This site is not focused on tourism, but because of its quirky style it frequently attracts people who *"take photos and ask about the nature, start and ideas involved on the concept"* (field journal, 8 February 2013). The Gap Filler head office was located in the corner of the site (Figure 46) and was removed in December 2012, emphasising the changing nature of the site.

Figure 46: Gap Filler office (a) and its removal sign (b)

Because of the openness and nice gardening works my first impression was that *"the area would be greatly used during summer time"* (field journal, 29 October 2012), when then the climate would be an attraction as it is in Windmill Centre. But talking to one of the café managers, their comment highlighted the opposite:

> *"We sell more coffee in the winter than we do in summer, especially the larger sizes of the cups, because people want to be warmed up because it's cooler. When it's hot… We had some days when it was 32°C and it was just dead, because people don't want to drink coffee when it's hot."* (M06)

Comfort in open spaces is also related to time of exposure to the weather (Givoni et al., 2003; Nikolopoulou & Steemers, 2003; Walton et al., 2007), and therefore, in cold winter days blankets and hot water bottles are provided to the ones who want to stay in the area for a longer period of time before going to work.

> *"Yes, we give [the hot water bottles and blankets] to some customers that we know. There's probably only about five customers that come and stay and bring their book, or they have their coffee and their scone [here] and we just give them a blanket and a hottie and they come and sit here [in the gazebo]. Or if it's frosty they'd seat by the heater in the front."* (M06)

Gas heaters and umbrellas are used in the area in front of the kiosk to amend the microclimate (field journal, 29 October 2012, Figure 47a). In cold mornings one heater in placed where customers wait for their drinks to take away. The café area has three tables and a few benches and is predominantly used for waiting while drinks are prepared to take away. As previously observed some types of place attract more men and others – such as cafés – attract more women. As observed in the new food court in Cashel Mall, in this space, because *"it is open and maybe 'messier' it tends to attract more*

men" (field notes, 8 November 2012) as a pub do, and not so much women as normally indoor 'organised and feminine' spaces do.

Figure 47: Gas heater and umbrella to amend microclimate (a) and Coffee Zone in a snow day (b). (Photo 'b' by Ian Carter)

Regarding the business itself the heat seems to be a hindrance and mid-season is probably the best season on the site. A key informant also said that *"in the winter people don't sit down"* and that *"the problem here is not the cold or the rain but the wind because the site is unprotected from the easterlies"* (M07). The wind may be a problem, but apart from that factor, it seems that not even the snow stops business in the winter and customers coming in and out from this site (Figure 47b).

Because of the mostly uncovered area surrounding the kiosk, especially where the tables are placed, similarly to Windmill Centre sunny days can be unpleasant as well. In sunny summer days with no wind the area is not as extensively used as during mid-season. In those circumstances most people looked for shade and some used the gazebo. The excessive sun is then something that stops people using the space and then during mid-season people stayed for longer than in the summer. Two umbrellas can be placed on the tables to provide some shade, although also similarly to Windmill Centre, in windy summer days – common nor'wester wind – the umbrellas cannot be placed as they can offer risk for people and traffic. The umbrellas are also used in wet – or snow – days, when they are located close to the counter to provide extra protection to the customers (see Figure 47).

Despite not being designed in a way to amend microclimate, the temperatures in this site and in Kyle Street Weather Station were similar in mid-season (SC1 and SC2), but showed a considerable variation in the summer (SC3 and SC4). The microclimate measured on-site shows higher temperatures in these cases, when exposed to the summer sun. In addition, lower wind speeds than the data measured by NIWA were consistently measured (Table 6).

Site	Day	max temp (°C)		wind direction		wind speed (Km/h)	
		on site	NIWA	on site	NIWA	on site	NIWA
South Colombo Street	SC1	26.5	20.8	E	W	1.9	5.9
	SC2	17.3	16.7	E	SW	6.3	8.6
	SC3	31.6	18.3	W	SW	1.7	9.3
	SC4	29.3	17.2	NE	SW	1.5	8.7

Table 6: Microclimate in South Colombo Street on the days of fieldwork and acquired from NIWA weather station.

Four data sets are not enough for a precise evaluation of influence of space design on the resulting microclimate. However, this on-site measurement provided insights on how people use the space in respect to the microclimate measured on those days.

Sydenham is a good example of places that had its urban quality improved after the earthquake. The area where this site is located had a reputation of being a rundown area before the earthquake (see Chapter Four, Section 5.3), and got better with the new uses added post-earthquake, as some interviewees described:

> *"(…) Sydenham was a really poor part of town for years and years and years…. They couldn't even get tenants for that mall, but now all the flash shops that used to be in High Street in town moved here. So since the earthquake it's just opening Sydenham up. (…)."* (E77)

The gazebo is the only shaded space and faces away from the traffic. Frequent customers who come to this area *"looking for a quiet moment especially if they are not alone tend to look for space in the gazebo"* (field journal, 31 January 2013). People by themselves that look for personal space but an entertaining area would sit in the front area closer to pedestrians and traffic. The main gathering area in the site is close to the Coffee Zone. This site characteristic combined with the types of users made difficult to do interviews in peak times. When there are larger numbers of people on site, they get very close to each other what makes uncomfortable to approach interviewees.

This site is, as Windmill Centre, an area that provides a reasonably quiet atmosphere – although it is also close to a busy street. The café in the site is a client-based establishment and the majority of customers are business people. In the Windmill Centre the microclimate proved to be an attraction and to have more influence on the patterns of use of the space than in Cashel Mall and Rotherham Street. In this site the same happens. Although the microclimate is not controlled, it determines if the place is attractive or not. In the manager's words:

> *"People love it. They love the intimacy and the personal service. Making people feel that they are valued and that it's different from everyone else.* (…) *And what we try to do is to establish a business with what we wanted since the beginning: We wanted to have that personal service, we wanted to be remembered, we want people to remember our names, [to be] friendly, because [in] some coffee places they look to you but they are too busy texting or chatting in the kitchen, reading… So we put all*

the effort to never do any of that. Instant service, friendly, personal, chatty… This is what we want. This is our main quality, and if people come and they know they are going to have that personal service and that intimacy, people will keep coming. And the weather, the temperature and the cold… We have even been here in the snow." (M07)

The same owners of this café opened a very similar one in Moorhouse Avenue, a wide avenue with heavy traffic and not many pedestrians. That area is a zone for large corporate buildings and the scale of the avenue is not a pedestrian friendly one. Also, because it is a busy avenue it is more difficult than in South Colombo to stop by and pick up a previously ordered drink to take away. For this reason this establishment was open just for a short period of time.

3. THE MAPPING EXERCISE

The maps presented to interviewees emphasised some of their favourite places and the places they dislike. The maps below show in yellow the favourite areas and routes and in red the areas pointed out as avoided, in blue are the case study sites. Rotherham Street and Windmill Centre were summarised in one map as they are located in the same area (Figure 48). Despite being further apart from each other, Cashel Mall and Sydenham were also analysed together, as the strong connection provided by Colombo Street made places and features of the Central City be frequently mentioned (Figure 49).

Figure 48: Summary map of Riccarton area (base map source: Map data ©2015 Google)

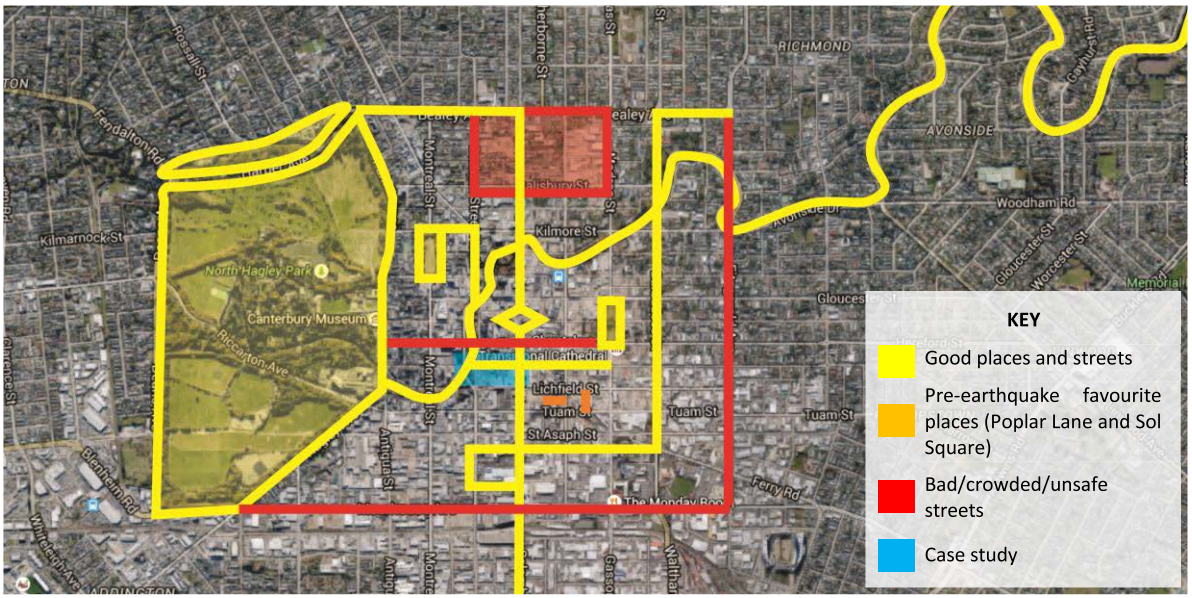


Figure 49: Summary map of Central city and South Colombo Street (base map source: Map data ©2015 Google)

In a general sense busy streets were avoided – such as Moorhouse and Fitzgerald Avenues, and Riccarton Road – yellow areas were mentioned as destinations and places people choose to be. Cashel Mall and areas in the Central City were mentioned as good places for shopping, but not for being outdoors because of the wind. Oxford Terrace was a preferred place. Places like Poplar Lane and Sol Square (in orange) were frequently mentioned as good social places. In yellow are also marked the favourite routes for walking, frequently associated with more street trees and greenery, and less cars and noise.

4. SUMMARY

This chapter has highlighted some important topics that affect the types of users, the use patterns and the strategies used to adapt to the climate in the studied sites. Different people look for different things in the city depending on their activity, lifestyle and age. Urban social spaces tend to attract younger people as they offer varied activities. Urban retreat space users are more selective, by age, lifestyle and activity, and the use patterns are more dependent on the microclimate. Some interviewees said it depends on their mood to choose where to go, because *"sometimes you want to see people and sometimes you just want peace"* (E44). A clear difference between the urban social spaces and the urban retreat spaces was also extensively pointed out in the intention of meeting friends or just having some quiet time.

In a general sense everybody seemed to like the urban retreat spaces, even if they do like both retreat and social urban spaces. But on the other hand, some people who choose the urban retreat spaces would not necessarily choose to be in the so-called urban social spaces. This seems to be influenced by the regional identity of outdoor culture and the desire to have a peaceful setting, even

when in the urban environment (see Tavares et al., 2013a). Adults choose a setting depending on their company, activity at that day or time, and even on their mood; but age is significant. Elderly people tend to prefer the retreat and peaceful spaces. Young adults tend to be less variable on their preferences, usually looking for social spaces with higher numbers of people. Lifestyle preferences also influence the choice of place. If people regard themselves as 'outdoor people' (Bell & Matthewman, 2004; Wray, 2009), they tend to be less tolerant of busier and noisy places and prefer retreat spaces within the city. By contrast people that see themselves as 'urban people' or 'urbanites' (Tittle, 2001) vary their choices according to company and activity at the specific moment. Another significant aspect observed during week days was the preference for one or other character of place according to the activity at the time. In work breaks business people said they prefer quieter places, while workers and people that use these spaces for leisure had mixed opinions.

Combined with the character of the place – retreat or social – the adaptation to the local climate is also subject to some environmental enhancement such as greenery and peacefulness. As an example, an interviewee who works indoors said she always goes outside for her work breaks, provided there is *"some greenery around or a tree to sit under"* (E27). In this sense Cashel Mall is the most attractive of all sites and Windmill Centre the least. Rotherham Street and South Colombo Street have some greenery that are more ornamental and regarded as *sufficient* or *nice* but it does not necessarily provide any type of protection from sun or wind.

Most people interviewed in the urban retreat spaces or during quieter times in the urban social settings expressed reasons for their choice of place that were linked to outdoor culture, and were well aware of the influence of that culture. *"People who live in Christchurch or in the outskirts of Christchurch are more outdoor people than people that live in Auckland, who are in big rush"* (E47). In contrast, respondents that prefer the urban life and the more vibrant lifestyle were more frequently encountered in the urban social settings. In accordance with Vallance et al. (2005), for many respondents of this research, a combination of a vibrant central city and peaceful surroundings for living were identified as an ideal quality of the urban environment.

Regarding the microclimate, humidity that at first seemed to be the most innocuous climatic variable in Christchurch proved to be the most important factor regarding the perception of the local climate and consequently the locals' attitude towards it. How could the sun increase the perceived temperature from the frequent -1°C during the nights and frosty mornings during the winter to a 'beautiful and nice winter day'? Because of this low humidity, when the sun is out the temperatures rise quickly. Sun and wind are easily amended through design (Givoni et al., 2003; Walton et al., 2007), therefore the sun and the winds are very important variables on the definition of microclimate in a very local scale, and life in open spaces is dependent on the resulting microclimate. A sunny

location tends to be desirable, while wind is typically the most unpleasant factor. On sunny days, if the wind is kept out the microclimate is usually pleasant, even in the winter. This also stresses the importance of providing people with direct microclimate experience before making a decision of staying in or outside, as the local microclimatic conditions may vary widely from the forecast for the city as a whole.

In a general sense, the number of people using outdoor areas in autumn seemed to be lower than during spring, although the days are similar. A possible explanation regards the tiredness of the dull winter days and the wish to enjoy the good spring weather 'promise', while during autumn it is not so present as the previous months were largely enjoyed in the summer weather (Pungas et al., 2005).

In mid-season the use of clothes as an adaptive strategy is extremely variable and important. The outfits varied from very warm jackets to short sleeves. Especially during spring, the influence of sun and the wish to enjoy the warmer weather is reflected on the clothes used. The meanings of spring in New Zealand and especially in Christchurch, the Garden City, are closely related to the blossoms and colours around the parks, as when the first daffodils show up, it is time to retire the thermals and heavy winter clothes. But it is not always predictable; in fact it is really unpredictable. Apart from the daylight availability, which is longer during summer and therefore heats up the air more than in the winter, some days are similar in winter and summer regarding the perceived temperature and humidity. During the fieldwork there were winter days that– in an adequate microclimate – reached 24.4°C (see WC7 on Table 5) and summer days when 12°C was recorded during the day and the maximum reached only 23.3°C (see CM10 on Table 4). This highlights the importance of designing with the microclimate in mind, especially in urban retreat spaces.

The way local people responded to climate was clear in the way they used public spaces, dressed and enjoyed the open areas. It seems that the climate accompanies Christchurch people, who know what to expect and 'scan' the city for 'nice' spaces. In the next chapter, how locals adapt to the climate from their own perspective, in particular the actions they take to be able to enjoy public open spaces, are explored.

CHAPTER SIX: The adaptive process

The post-earthquake condition of Christchurch at the time of this research highlighted some interesting aspects of adaptation regarding both pre and post-earthquake environments. In this chapter I explore locals' experience of the climate in Christchurch, the strategies they use to adapt to the urban (micro)climate – both at the personal and collective levels – and the role of an *experimental city* in shaping local people's adaptation to the climate. The findings are based upon the interviews and my field observations.

1. EXPERIENCING THE LOCAL CLIMATE

In any place and any culture, the way local people see and adapt to the climate is dependent on the collective perception of what is an appropriate attitude to take (Gorman-Murray, 2010; Harley, 2004; W. B. Meyer, 2000; Orlove, 2004). Although there are some common sense attitudes such as *"if it is hot in the summer, so you are more likely to go outside, otherwise if it doesn't feel like summer or if it is cold, you'd stay inside"* (E70), there are also some attitudes that are understood as the appropriate behaviour and which are understood as 'normal' because of past experiences, as an interviewee described:

> *"When I was a kid in Invercargill you'd be riding a bike at night, and it was like 5 or 6°C and you wouldn't have a jacket on, it would be just a shirt. Then the first time I ever went to Nelson it must have been 14-15°C, [I saw] people wearing a t-shirt. In Invercargill a t-shirt is just a heavier duty singlet. It's just a more sensible singlet to wear under your shirt, and then to see people wearing t-shirts was just weird. It was as if they were walking around in their underwear, no one does that in Invercargill (…). But I suppose you grow up in a certain environment and you sort of figure that 'this is the norm' until you move away."* (E76)

The meanings attached to the seasons are also particular to different cultures (Ahas et al., 2005; Boyd & Gardiner, 2005; Jauhiainen & Mönkkönen, 2005; Palang, Sooväli, & Printsmann, 2007; Pungas et al., 2005), in some places, for example, the meaning of *"summer is to wear shorts outside in the evenings, is to always have a smile on your face and get a tan"* and therefore, *"the summer in Christchurch is not exactly summer"* (E42 – from Portugal). As a consequence of these collective meanings, both the experience of seasons, the meaning attached to them and, consequently, the expected behaviour affects why and how people adapt to a certain climate.

Christchurch people know the local climate very well. The climate was usually described as good, and in a general sense not too hot or too cold. The general patterns were mainly described based upon the low rainfall, the importance of the sun and the wind patterns.

> *"[In the] summer you get some relatively warm to hot days, unfortunately some of the sunny days are wrecked by the cold easterly wind. (…) Christchurch is one of the driest parts (…) of the country, even if it is not always the hottest. But during the summer I find it pleasant, because it's not really hot, it doesn't have high humidity, so while sometimes a strong nor'wester wind can be a bit irritating it's quite a pleasant summer. Spring and autumn is a bit of a mixture, where you can often get quite a lot of nice days, but it does get chilly once you get past late afternoon, so you really have to prepare (…). And obviously winter you get the two types of winter days in Christchurch. You get the beautiful frosty ones where it's calm, usually fairly cloudless and if you get days like that for 24 hours, you get the freezing cold nights, but then you get the beautiful crisp morning followed by the sunny day where if you are actually seated in the sun and sheltered it can actually be quite warm during the middle part of the day. (…) And then [the second type of day] you have the real wintery blast days when the southerly comes through and that can make Christchurch as cold as just about anywhere on earth other than Antarctica!"* (E79)

Besides having seasons that generate some type of adaptation throughout the year, Christchurch has a highly changeable weather within short periods of time, frequently prompting adaptation and constantly challenging the capacity to adapt to the climate. Most respondents discussed the 'four seasons in a day' pattern, which is generally seen as a strong characteristic of the local climate and *"even if they [the forecast] say it's gonna be sunny, it's usually windy and cold, or it rains for a bit and then the sun comes out"* (E60), and *"you can never be 100% sure of what you will gonna get"* (E17). A foreigner living in Christchurch for six years described his experience:

> *"Overall you can get a lot of changes within a day and especially you can't really trust the weather forecast. (…) You can't plan too much depending on the weather forecast. You tend to get your weather patterns, that's what someone told me a while ago, you need to get your southerly, easterly, nor'wester… It just goes through this pattern. So overall it's sort of predictable to a certain extent, (…) but it can change quite quickly as well."* (E32 – from Austria)

Many respondents said Christchurch is not too hot or too cold, so they were asked to describe what they do mean by too hot or too cold.

> *"When we go to zero or -2°C, that's when we go, yes, it's gonna be cold today and we are going to have a frost, we are going to have to take our jug out for the car, but otherwise, quite often when we get a cooler morning that means that we are going to have a beautiful day like this. (…) I love the cold but I also love the hot weather. (…) So it can't get hot enough here for me, but I was uncomfortable in Thailand, it was 38°C and (…) I couldn't think, it was so hot and the humidity was so high. In Christchurch because we don't have that humidity, it's beautiful and it's 30°C."* (E46)

Associated with this perception of a mild climate is the idea that Christchurch does not have extreme weather, although it can snow sometimes during the winter.

> *"The biggest extremes we get here is a bit of snow fall every four or five years and might be a fall or two in the city every one or two years (…). We might get a week of*

> *steady rain that swells the rivers up, but there's (…) no extremes of weather here."* (E76)

On the other hand the description of *good weather* is generally associated with *"a hot warm day, a hot day, not too much wind"* (E57) and also because of the generally cool winds, *"everything without sun"* (E54) is considered unpleasant. An interesting aspect of the local climate that affects how people perceive and react to the weather is the predominant patterns of sunny days over rainy days, even during winter season. As an interviewee described:

> *"(…) you get mild winters and during the winter, you might get a run of bad weather, but it is usually only two or three days a week that the weather actually affects you. I will still drive my [convertible] car if it is raining; I've driven it in the snow. (…) I've got an antique shop around the corner so the first or second wet days after fine days are usually quiet, then third and the fourth wet days are busy and then the first fine day is quiet and the second fine day is quiet, but the third and fourth fine days are busy. And I used to have a hotel and there was the same thing. That is because if you get a fine spell [people] will do things on the fine days and they won't go out shopping or go out socializing because they have other things to do, but after that they get bored. And same if it's rain[y days]… They get sick of days at home, so after two or three days they will come out and brave the weather."* (E76)

This idea that the general climate in Christchurch is *"pleasant except for the cold easterly winds"* (E77) was present in the majority of the interviews. The perception that the winter weather is good because if you have *"frosty mornings you have lovely days after that"* (E77) was also frequently mentioned. Other respondents referred to the winds as something that can change the whole perception of comfort. These people seemed to find Christchurch 'good', but then talk about the prevailing winds as an undesirable variable.

> *"If we didn't have the easterly, which is basically our prevailing wind we'd have many more summer nights when we have still nights. Often when we have a still night is a beautiful night, and the climate is fantastic. Because during the summer is drier and you get the nor'wester which is quite warm, but the easterly is always there at some point. It sort of ruins it. So I think it is a nice climate. I enjoy winter and I don't mind the cold. Sometimes in the winter we have some really good weather, we don't have so much wind in the autumn and winter, so we have nice clear days. They are cold, but they are still. But in the summer it's a bit windier."* (E26)

The wind is therefore seen as a major defining characteristic of the local climate:

> *"Canterbury is all about the winds. Nor'westerlies of course which is hot and I guess most people like them because it's a nice warm hot weather. Everybody hates the easterlies and of course when the southerlies come it normally brings rain, but not always… But certainly drops the temperature. So yes, it's all about the wind. Normally if it comes from the north it's normally pretty good nor'westerlies or nor'esterlies."* (E22)

In Christchurch, when asked to describe the climate, locals rarely talk about humidity and when asked about the meanings of cold weather, many respondents mentioned that it is more about the wind and sun, but not so much the temperature. The wind chill was also referred to as a problem and something to be avoided.

> *"[The problem is the] wind chill factor that can drop anything. It depends, if it is a sunny day (…) I don't mind sort of 4°C, it is bearable. [If it is] sunny and there's somewhere behind a glass that you can sit."* (E44)

Rain has also been described as one of the most unpleasant variables:

> *"I prefer nice sunny days. Doesn't matter the temperature, it's just the matter of putting clothing on. I like the sunshine rather than… I don't mind light rain, but yes… Heavy drizzle I get pretty grumpy."* (E31)

Although the main ways the climate shapes people's lives was described to be the wind and the rain, a non-local highlighted that *"when you live in other places in the world you just think it's normal to go outdoors in the rain"* (E66 – from England).

Christchurch residents therefore have a very particular attitude regarding microclimate preferences. Many respondents of this study indicated they feel comfortable in a wide range of thermal conditions, suggesting that temperatures needed to get down to *"single digits"* to make them *"feel cold"* (E26). Generally, local conditions do not restrict outdoor activities as it is a *"pretty mild climate"* (E22). Many respondents said they are *"used to extreme",* they "*can go out walking in the middle of the winter"* and they "*wouldn't stay home because it's too cold outside"* (E27). In fact most respondents said they *"don't think it ever gets too cold in Christchurch that you can't go out and do something"* (E27). Considering Christchurch has minimum average temperatures of 4.9°C in May, 2.3°C in June, 1.9°C in July and 3.2°C in August (NIWA, Taihoro Nukurangi, 2013a) and that the image locals have of themselves is that of *"tough people"* who *"don't get things get on [their] road, so [they] would just put a few more layers on and go out and do it"* (E26), the response to the climate is based upon adaptation rather than pure physiological variables.

Despite being described as a good climate in most cases, Christchurch climate was described as unpleasant by elderly respondents. For senior age groups it can be harder to keep warm, as their physiology changes. As a consequence, although they still like to do things outdoors *"it has to be warm"* (E65). In these cases the Christchurch winter was described as unpleasant.

Warmer days, over 25°C, have been widely described as 'hot', despite most respondents believing Christchurch does not get uncomfortably hot because of its frequent wind. Preference for cooler temperatures than those ones tending to hot was also expressed.

> *"I think there is an argument that I have particularly with my son that lives in Australia, in Brisbane, where it is very hot. And (…) my opinion is that you can dress for the cold, you can put more clothes on. It is much harder to be outdoors in the heat, over 30°C the heat is just beyond me, I can't cope."* (E40)

The weather in Christchurch was said not to prevent outdoor activities, but the wind can be a problem in some circumstances. While Tacken (1989) has reported to have difficulties on finding volunteers for his research in the Netherlands when the temperature was below 14°C, I was able to carry out interviews even in cold mornings when the weather station recorded 7°C (RS5). Locals adapt, and the way they do so – both regarding the indoor/outdoor temperatures difference and need for sun in spaces protected from easterlies – are important information for urban landscape design.

In relation to the most unpleasant variables, the wind or rain were said not to be *"so bad"*, but both combined makes the place *"horrible"* (E35). Christchurch is therefore *"all about the winds"* (E22), which proved to be true in the fieldwork days. These wind patterns can considerably change the temperatures or bring rain, and for that reason the local weather was described as being "*unpredictable", "temperamental", "changeable", "challenging", "indecisive", "versatile"* and so forth. The fact that the weather can be unpredictable was evident in almost every discussion about microclimate, outdoor activities and adaptation, thus demonstrating the role of weather in everyday lives (Strauss & Orlove, 2004b).

A different perspective described how the climate shapes people's lives in a broader sense, as an interviewee explained:

> *"[In Malaysia] The businesses don't start until 10am and the shops will close at 10pm, so most of the businesses are actually done in the quarter part of the evening, because it works better like that. At midday, although the shops open at 10am, nothing really happens until 2-3pm when it is starting to get a bit better [cooler]. I have friends in Spain and they have been dealing with 45°C, and with the siesta all just shuts down in the hot part of the day. Nothing happens! So we are pretty lucky here, I'd rather be here probably than anywhere else in the world because you do have the seasons, it's not too cold, it's not too hot… It's not too dry or too wet."* (E76)

These cases highlight that the seasons and the heat in some parts of the day affect the local lifestyle. The motivation to use or not the urban spaces are therefore closely related to cooler environments – especially because of the wind – and times of the day when the sun is lower. Regarding the design of these public open spaces, the challenge is how to enhance the use of these areas when the climate is more pleasant and people want to be outdoors. This means instead of trying to fit in activities as they happen in other cities, an appropriate strategy would be to understand the dynamics of these places and focus on activities that can be developed during certain times of the day.

In summary, the local climate is generally experienced as a good one, especially if the unpleasant variables are taken into account when planning urban spaces. Christchurch has a temperate climate with well-defined seasons (see Chapter 4, section 3). Although the winter has cold days the general perception is that it *"[n]ever gets too cold in Christchurch that you can't go out and do something"* (E26). Rain, and especially the combination of rain and wind, seems to be considered the main and irresolvable problem for open public spaces, as the other main variables can be controlled or remediated. A grey sky has no natural solution besides waiting for it to go away, but winds can be 'excluded' and sun 'allowed in', especially during the cold weather.

Wind and sun are therefore the main climatic variables that influence the experience of microclimate in Christchurch. A sunny location tends to be desirable, while wind is typically the most unpleasant factor. On sunny days, if the wind is kept out the microclimate is usually pleasant, even in the winter. This also stresses the importance of providing people with direct experience of the microclimate before making a decision of staying in or outside, as the local microclimatic conditions may vary widely from the forecast for the city as a whole.

As one interviewee put it, people are outdoors:

> *"Because it is just something that you want to be doing. So it doesn't really kind of stop you from doing it (…), because we enjoy it. But I guess we probably do way more in the summer and do longer travel, (…) because in the winter you need to be home by 3pm before it is getting too cold. Whereas in the summer time we don't need to be home until like 9 or 10 o'clock at night, so you can go a long distance, go further."* (E17)

The Christchurch climate does not stop locals undertaking activities, but changes the way they happen, therefore provoking adaptation, to which I now turn.

2. STRATEGIES TO ADAPT TO URBAN (MICRO)CLIMATE

Besides the physiological thresholds and individual psychological responses (de Dear, 2004; Fanger, 1970; Humphreys, 2009; Nikolopoulou & Steemers, 2003), adaptive capacity also depends on the will to adapt to a certain environment. Indoor environments are easier to control than outdoor environments. They are also expected to be more controlled as the activities to be developed inside are defined and in general require low metabolic activity. The urban environment, on the other hand, can offer varied stimuli prompting the need to adapt (Gehl, 2010; Stevens, 2007; Whyte, 2001). There are many strategies – on individual and on collective levels – that allow people to adapt even when the climate is not what would be considered 'ideal' on the physiological models.

In this section I discuss the strategies adopted by Christchurch residents to adapt to the local climate. A number of strategies were identified both at the individual and at the collective levels. Six main strategies can be outlined: (1) checking the forecast, (2) choosing what to wear; (3) making use of clothing layers; (4) choosing to go to places with favourable microclimate; (5) identifying ideal weather and seasons for outdoor activities; and (6) social interaction as a reason to adapt.

2.1. Individual level

Adaptation on the individual level refers to strategies that a person adopt to adapt to (micro)climate conditions. This involves making use of forecast tools and making use of more or less insulation from clothing (Givoni et al., 2003; Humphreys, 1977; Tacken, 1989; Walton et al., 2007) and choosing places to be. Adaptation can happen in two ways: as anticipation (checking the forecast and how to dress) or as a reaction (making use of clothing layers and choosing favourable places in the city) (see Smit & Wandel, 2006).

Checking the forecast

On a day to day basis, an anticipatory way of adapting is checking the weather forecast. It was broadly described as a tool that helps local people grasp what to expect from the local weather, so they can anticipate the adaptation. The majority of interviewees said they *"listen to the weather forecast and think of what [they are] going to do"* (E63) or check on their mobile the MetService application. Others said that in a general sense they just look out of the window and see if *"the sun is shining (…) it's a nice day regardless of the temperature"* (E69). Anticipation, based upon the weather forecast, and clothing are frequent strategies of adaptation, but just looking for the sun might not be enough depending on the wind patterns, as described by an interviewee while the portable weather station showed 9°C (RS6):

> *"I check the forecast and I look out my window, and I saw the sun today so I didn't wear that many clothes. [I have] just a t-shirt and a jersey, which probably was a bad decision, I am a little bit cold. Usually I'd wear lots of jackets and stuff. So even when I am outside I'd be warm."* (E49)

This mistaken impression is generally a consequence of the cold winds. Depending on the time of the year and direction of wind, even a slight breeze (especially from the east) can cool down the air temperature significantly.

> *"Because we have a prevailing wind called the easterly and it could be a southeast, a northeast or an easterly, and it's a bitter bloody cold [wind], and it starts from nothing sometimes, so you've gotta carry a jacket."* (E45)

When asked about the most unpleasant factor of the local climate and the reason for the need of adaptive strategies, the easterly winds were the most broadly mentioned variable, as interviewees explained:

> *"The easterly… There's always the easterly winds that always has a bit of 'bite' to it. So that's why you always need a jacket even in days like today. 'Cause there's just a wee bit of a breeze that makes it a bit cold."* (E69)

The forecast is used in these cases to choose how to dress, the layers to have handy and to check for possible changes throughout the day.

Clothing choices and layers

The choice for clothing is therefore another anticipatory strategy, however the patterns of weather can be misleading, even during summer:

> *"I think what sort of day I think it's going to be, how cold it's gonna be. That's gonna dictate what I'm going to wear. The winds, during the summer (…) you could be in your house and have sunshine but then you go outside and the easterly is blowing and it's freezing. I'd probably always wear shorts on summer, but I'd also wear a jersey."* (E26)

In some places *"you just know you don't need to take a jacket, [because] even if it rains, it's still going to be warm and you never have to take a jersey"* (E46). In Christchurch, however, the unpredictability of the weather generates the need for using clothing insulation not only in an anticipatory way, but also in a reactive one. The changeable local climate is closely related to the wind patterns, and is the main reason for always having access to warmer clothes:

> *"Well, not on me, but I try to make it pretty handy. Even when I wear t-shirt I always keep thermals handy. I mean, it's a beautiful day, but you never know. If the easterly comes in a day with easterly, what we call easterly, as soon as it blows it increases the old wind chill".* (E22)

The means of transportation used also influences how much the weather plays a role in people's lives. As an example, a frequent bus user said that if the weather was bad – meaning raining – they would not go out *"because [they] bus everywhere, and don't have a car, so the weather does hinder what [they] do quite a bit"* (E50). But the frequent driver of a scooter had a different perception:

> *"Sometimes if it is really really raining I won't use it [the scooter], I'd take the bus instead, but usually I am probably in advantage because I have to take my jacket everywhere anyway, so I am always prepared. But if I am out somewhere and it starts to rain or gets cold I can just run back to the scooter and get my jacket out."* (E78)

The technology developed for skiing and tramping in extreme cold temperatures has also generated, over the time, a shift of the adaptation and response to the climate. Heavy outdoor jackets allow a light layer to be worn underneath. During the winter, just wearing a thick down-jacket on the top of thinner layers is a common strategy. Interviewees highlighted the overheated indoor spaces (see also Chapter Five, p. 7) as the reason for adopting this solution.

> *"I normally just warm up on the outside, so I can take it off when I get inside… Because in Christchurch inside is generally a lot warmer, especially at work and at home (…). So I layer myself to have little clothing on when I am inside otherwise I just got too hot and then I come outside and it's freezing cold."* (E39)

These overheated environments generate an overall unprepared public for the public open spaces:

> *"In the winter it's quite frustrating because it's going to be freezing outside, but you know that if you are going to spend most of your time indoors, it's going to be really warm. So you can easily dress up for the outside and then spend most of your time inside (…) and find yourself overheated."* (E51)

Although heating the indoor spaces make them more comfortable, the overheating also affects how people use the outdoor spaces. As pointed out above, when preparing to be indoors the adoption of a single heavier layer is the preferred solution, however these two layers may not be sufficient for a prolonged time outside.

> *"When I was a kid for example, our parents used to make us wear wool and take big thick wool jerseys which were a bit of a pain. Whereas now we have the thermals and the down jackets are very popular, and the ability that it gives to you actually, especially if you are going from outdoor to indoor which is a big thing here in the winter, and which used to be a pain. So if you were going to places you knew you'd be outdoor for a while in the freezing cold, but then you go into places that were, by comparison, ridiculously hot because of the heating that was always a pain. In the old style clothing it wasn't that easy to take layers on and off. Whereas now thermals are quite good because inside, unless it's stinking hot you can basically wear a thermal with a normal shirt and then maybe take a jacket, you don't even need a big wool jumper anymore or ten different layers of clothing (…). So it certainly impacts on people probably we don't notice it, but if you are coming in from outside, in terms of what people wear, we probably do wear items of clothing that is actually stuff that has been designed for outdoor activity. But we wear as part of our normal clothing."* (E79)

In a different scenario, when dealing with rain, the clothing technology also allows people to experience the weather in a different way, as per the experience described by an interviewee:

> *"Last week I went running in the rain in Golden Bay and I really like it because it changes the environment, it feels closer around you and I actually just got a decent rain jacket which means I can go out and be in the rain and not be soaked through, what is quite good. I didn't know rain jackets could actually be that effective!"* (E74)

In addition to forecast and clothing, which are actions taken by individuals, other strategies to adapt to the microclimate happen in a largely collective way. Locals know very well the local climate and as a collective response to it they 'scan' for favourable microclimates throughout the city, as discussed next.

2.2. Collective level

The collective level of adaption refers not just to strategies people use when in groups, but also refers to shared meanings which generate a common and cultural reaction to the local climate and microclimate. These adaptive strategies are largely reactive and can be identified by the way people choose weather and seasons for outdoor activities and places to spend time in the city, both for its microclimate and for its social character.

The built environment, regarding the stimulations it provides, can work as a motivator and stimulate varied responses from its users, including response to the climate (Nikolopoulou, 2001; Nikolopoulou & Steemers, 2003).

> Climate and weather are an attraction and an obstacle in outdoor staying. Urban life today is concentrated to certain times and certain places where optional (leisure) activities seem to dominate. Many traditionally outdoor functions have been built in to be independent of season and weather, such as shopping areas and sport facilities. On the other hand people crowd in open air cafés under heaters, wrapped up in blankets to prolong the short season – an urban phenomenon that is new in cold climates. The short time spent outdoors makes it the more precious. Sun or shade, exposure or shelter from the wind, etc. make the public urban spaces more or less suitable for different purposes. The microclimate is a property of the environment; a consequence of the surrounding physical elements. (Westerberg et al., 2003, p. 1)

Weather and seasons for outdoor activities

The seasonal changes shape lives according to activities that are more appropriate to a certain weather or microclimate condition (Olwig, 2005), forcing locals to engage in different activities throughout the year. As an example, people play sports in parks in the summer and *"during the winter [they] play it indoors"* (E53) or things that are generally done with family such as camping which is a summer activity, and *"we'd still be camping if it was raining, but never during the winter"* (E53). The weather affects locals *"in the winter more than anything else, [but] it doesn't affect [them] that bad in the summer"* (E47). Some outdoor activities were also said to be more frequent in warmer seasons because the days are longer and therefore is possible to *"pretty much every night (…) go for a bike ride or walk up the hills"* (E29), for example.

> *"Even in the winter a cold day which might actually be showing 6-7°C on the thermometer, but it's not a cold wind, and maybe is dry, I'd quite happily go out and*

> *walk, because you just wear your thermal and it's actually quite pleasant. (…) But at that sort of temperature I wouldn't be going out for a picnic…. And I guess it's sort of like that in summer or in the warmer parts of the year, because then it's sort of a mental thing, it's psychological. Even if it's relatively pleasant compared to the winter, would think you'd wait until the day it's 25°C plus before actually going out and doing things. Whereas if it was other time of the year you'd just go out and do it, just because you are grateful to [have it]. (…) So I mean growing up in Christchurch, and being used to the weather and I guess I would have a fairly high threshold of being able to handle the cold, but if I was just sitting around, like we are now, I probably wouldn't do that in the winter, unless it's one of those pleasant crispy days, when it's actually quite nice in the middle of the day. [Otherwise] I wouldn't be sitting here in an environment like this apart from a quick five minute coffee, but in a hurry if I was wearing a down jacket and thermals and everything."* (E79)

Some daily activities can also be shaped by the weather as the reason for biking or not and described themselves as a *"fair weather cyclist"* (E32). These interviewees *"would ride when it's sunny or warm"* (E63). In other cases cyclists described to cycle according to the wind, because biking against nor'easterlies and southerlies is *"like biking into a brick wall"* (E33). So some described to check the wind direction and depending on it they *"put the bike in the bus on the way back"* (E56).

Choosing places for their microclimate

The choice of favourable microclimate when deciding for places to spent time in the city is another reactive strategy and can be taken by individuals (especially in retreat spaces) or groups (in social spaces), but it is a general collective response as part of locals' daily lives. As presented in Chapter Five, the measured (micro)climatic data proved to be fundamental to understand why some places are more popular than others in the winter. Knowing the climate, its patterns of change and the winds, some interviewees highlighted the choice for the places based upon its microclimate especially when choosing for urban retreat spaces. Some people said they tend to 'scan' for places they know will have a good microclimate so they *"always choose a place that has light and sun"* (E65). In a still day (SC4), when asked if the microclimate made difference on the choice for a specific place an interviewee commented:

> *"Of course it does. I wouldn't be sitting here in a sunny day if the easterly wind was here. It's just that we've got no wind today… It would come straight from there…. And It comes straight of the sea."* (E77)

On the other hand, in a windy day (WC5) an interviewee said that the microclimate influenced their choice to be outside in the Windmill Centre *"because [they] knew it would be sheltered [and it] always looks really busy because it gets the sun in the morning"* (E25). And also in Windmill Centre (WC8):

> *"I came here today knowing that it was possible to sit outside, apart from the risk that it might be too windy. That probably influenced me to come here as opposed to many coffee shops where you have no option but to sit inside. I have made a deliberate decision to come here. (…) But if the day was different it would open up whole different choices."* (E57)

When asked about the memory of public open places that the interviewees remember because of the microclimate a common reference was to *"places with courtyards"* (E79) where:

> *"In a nice pleasant day you go and sit in the courtyard which is sheltered from the wind, but maybe in the sun. Especially during the winter those crispy days are actually I think it's one of Christchurch's best secrets really. They are beautiful… Frosty in the morning, but between 11am and 3pm it's actually quite nice (…) There used to be the Arts Centre, maybe around the square could be quite nice, Cashel Street… Places like Cashel Street were ok. They weren't particularly beautiful places that you would go to sit in, but that sort of thing on a nice sunny crispy winter's day was actually pleasant enough. Whereas some of the more outdoorsy places like the beaches and the hills, in the winter you wouldn't necessarily think of them to go to sit and relax."* (E79)

Regarding the choice for places in the city, along with the avoidance of windy areas, the sun was frequently highlighted as desirable, because when *"the sun is shining even though it's quite cold, it's a nice day"* (E69) and people *"prefer to be outside, prefer to be facing north"* (E55):

> *"I'd say that if it's sunny, outside here in New Zealand you are fine. Even if it is 12-13°C if the sun is out it feels quite warm. (…) It's better generally [than the UK], it's warmer and it doesn't get as cold in the winter, and even in the winter the sun feels warmer, so you can still sit outside."* (E64 – from England)

Then the sun and the wind are the main factors to influence people's decisions about places to go. However, although the sun is the most desirable factor, the wind can still hinder the use of some sunny spaces, as described by an interviewee:

> *"If the sun is out I'd definitely sit in direct sun light before anything else, but if it's windy then I'll look for a place that cuts out that wind, even if it sacrifices sitting in the sun, because the wind is always cold (…)."* (E39)

Some pre-earthquake social places were repeatedly highlighted as having been good places to go. Places that were pointed out as ideal were Poplar Lane and Sol Square. These places were described as popular because they were protected from the winds and offered interesting urban environment. On the other hand, Cashel and Hereford Streets, in the heart of the Central City, were mainly referred to as bad places to be during most of the year. The expressed reasons were the lack of sun and the orientation of the streets, as east-west streets tend to channel the cold nor'easter winds. About the pre-earthquake memories of microclimate in the Central City an interviewee commented:

> *"One particular street called Hereford Street… (…) I worked in Oxford Terrace by the river, walking up Hereford Street was just the most terrible coldest street in the city because it was just buildings in both sides and no sun."* (E77)

And about Cashel Mall:

> *"This is quite a cold mall I think, it has always been. It's facing the wrong direction, I mean it is east-west. It is probably not quite right… But they had to do with what they got at the moment. I think it would be great if they… You know they are clearing all those buildings down, it would be great if (…) that could be utilized for a lot of people [as parks], you know just to feel good."* (E44)

The earthquake has changed both the Cashel and Hereford streetscapes. Respondents expressed their desire to see an amended microclimate on these streets.

> *"We hope that as a result of earthquake damage, we take advantage of the opportunity to fix some of the problems like I remember Hereford Street, for example, it was a very cold windy street. I don't know why it was windy, it must have been the way that a certain wind was channelled up to Hereford Street, the nor'easter particularly. I am not sure if you can stop that, but presumably there's something that you can do about it with regards to buildings."* (E57)

An interviewee from England living in Christchurch also pointed out that they came to Christchurch *"under the understanding that every day would be lovely, so [they were] disappointed"* (E34). The reason to the perception of cold weather was attributed to the fact that *"because Christchurch is so flat and open it's colder"* (E34). This perception was especially highlighted in the emerging urban settings, where *"it is more windy because there's more exposed areas"* (E43) and *"we can get it [the wind] from all directions (…) with the gaps in the landscape"* (E63). Therefore, although *"there's more sun, because there's less buildings blocking it away, there's more wind as well"* and then *"it feels colder"* (E39). Cashel Mall pre-earthquake was also described as a *"big wind tunnel, because even though the buildings were just two or three storeys high, the sun would disappear at lunch time and was just cold and windy"* (E28).

Still, *"if you have less high rises, than you'd have the sun coming in"* (E36), which is desirable. However, there is also a market pressure which has to be balanced with the Garden City image, because if *"you put the buildings up and higher buildings need more green areas, it's just about balancing in the right manner"* (E22). Especially after the earthquake, a high rise urban environment does not seem the most attractive, as also expressed in the *Share an Idea* (Christchurch City Council, 2011c): *"no building should be higher than the tallest tree and all should have accessible rooftop gardens for sun, shade, recreation and/or business"* (Darryl, Bryndwr).

All these reasons pointed out above highlight why urban landscape design decisions are very important in a climate such as Christchurch. Providing sun and protecting from the prevailing winds

are important strategies that cannot be underestimated, as interviewees affirmed that if you can "*step [out of] the wind and be in the sun (…) you feel ok; you can trap the wind out"* (E44), and another one said *"that's always the problem: you find the day quite hot, but then you drive all the way out there, but it's so windy"* (E59). Therefore, the variable that causes more discomfort is the patterns of wind, which should be always present in the minds of urban designers in Christchurch. Moreover, the provision of microclimates should be intrinsic to the design of open spaces in places where easily controllable variables hinder the use of open spaces.

Regarding the experience of comfort in open spaces, the sun was the most frequently mentioned variable. The comment *"I sat here because it was sunny"* (E68) was very common in the majority of the interviews. Therefore the choice for the open place was related to the sense that if the sun is out, the day is seen as a nice one.

> *"It depends on a lot of things, because if it is windier it feels colder, and if the sun is shining then it doesn't feel so cold if you are sitting in the sun. So in a cold winter's day, you can still sit outside in the sun if there's no wind and it is sheltered and in the sunshine. I don't know if I could actually specify a temperature. I am quite happy sitting outside in a cold winter's day with the sunshine."* (E51)

Locals said to *"always choose a place that has light and sun"* (E65), that being a frequent reason for the choice for Edward Hopper Café in Windmill Centre because *"there was light and it was on the right side of the road and in the sun"* (E65). In this sense, that specific café was said to be chosen because of its microclimate and therefore the customers know they can enjoy the outdoor area even in a day with unpleasant easterlies.

The strategy of choosing places to be according to its response to the local climate is also taken into account when choosing a place to live.

> *"I chose my house that way. I went in different times of the day before I bought it. I watched the sun, I watched the light and I went just to see what the sun is like and how was the heat, it has to face the sun."* (E65)

It has been highlighted that *"living in a cold climate it does make it harder to go out, maybe [in the rebuild] they need to plan it so just it is warmer, and encourage people to go out"* (E59). An example of how the climate is important is that people chose places they *"knew would be sheltered"* and *"it gets the sun"* (E25). This was highlighted as a common strategy for choosing places to go within the city. Locals said they 'scan' for places with good microclimate as a strategy to enjoy the public open spaces, highlighting the importance of designing for amended microclimates and providing spaces that respond to the seasonal and highly changeable local climate.

Participants of the *Share an Idea* (Christchurch City Council, 2011c) have also extensively highlighted their desired for the city, including its microclimate: *"plenty of green spaces which are accessible, warm, sheltered and sunny to take lunch breaks in. Get rid of noisy buses and minimise cars"* (Latham); *"provide lots of outdoor seating areas with easterly shelter so that people can linger longer in the city without freezing in the wind"* (Sally, Rangiora); *"prevent wind tunnels; have low rise buildings, sunny walk ways and gathering areas, gardens; replace The Squares' reflective tiles, safe"* (Rachel, Halswell). In a general sense *"buildings straight along the trajectory of the prevailing wind seem to be an odd solution",* and *"that was one of the reasons why places [protected from the easterlies] were becoming much more popular, because they were sheltered and people could have an outdoors life without being battered by the wind"* (E05).

Post-earthquake Christchurch is *"a completely different city now"* (E46) and locals are *"making little extra shelters outside for the wind and rain in the winter season, because they know it's their off-peak season because it's a lot quieter because people won't come out as much"* (E46). These strategies to respond to people's demands are frequent in Christchurch, as it is a way of attracting people back to the urban centre.

Choosing places for their social character

A different reason for choosing public open spaces in the city is their social character. The types of spaces are important in the scope of this research because in public open spaces the presence of people and the busyness of the area is a factor influencing locals' attitude toward climate. People tend to adapt easier or at least find a way of adapting to be able to stay for longer in certain places when in the company of others. In this sense the presence of people relates to the way climate is perceived, as a respondent described on an overcast and breezy 13°C day (CM6):

> *"If there wasn't many people [in the city], maybe I wouldn't have come. The perception of having people there makes me feel not as bad [about] the weather. But depends on what you are doing, so you might want to go somewhere to have more solitude."* (E43)

In places where the social activity is the focus – such as Rotherham Street and Cashel Mall – the tolerance to imperfect climatic conditions was greater than in places where the attraction is the place itself – Windmill Centre and South Colombo Street. In this sense the company of friends and colleagues is fundamental on deciding to go out or not as people would go out *"after work and sometimes it's like raining and [they]'d still sit down, whereas if you are on your own [you]'d just go and have a coffee at home"* (E47). So, being with friends or being alone in a public open space has different meanings when considering the adaptive capacity to the local climate. This shows that in urban social spaces there are reasons to adapt that go beyond the place and its qualities. In these

cases the presence of people and the social scene work as motivators. In urban retreat spaces, on the other hand, the places themselves are the attractions and the activities developed in these places are quieter requiring more controlled temperatures.

> *"If you are thinking about just going out for a drink and enjoy the sun and sit in a pleasant environment I'd probably think more of places that are attached to nice areas that I know that might have an outdoors area that you could sit in the sun if it's a nice day, or near the river, or the beach, or the hill… Which I guess comes back to the landscape values… I am not particularly interested in going out of my way just to sit and see other people."* (E79)

Whilst some interviewees said they choose to go to some places such as *"little park areas just sit with a bit of green around"* (E11), others said to like to *"be around people"* but avoiding a *"traffic-wise busy place"* (E77). In Windmill Centre, because it is close to *"such a busy road"* and *"it is so close to the traffic"* (E19) it was considered unpleasant by some. In some cases it was reported that the interviewee thought about sitting in the sun, in the table closer to the street, but changed because of the traffic (refer to Chapter Five). On the other hand, when choosing to sit further away from the street the perception changes into a more relaxed atmosphere. As an interviewee described:

> *"If I was in a café inside of the mall I wouldn't be relaxed. There are also the ones in Rotherham Street. I was thinking about that before, because this road is much busier than Rotherham Street, but I actually feel there busier than here. Even though it's a busy time of the day with traffic, I don't consider it really busy at the moment, like you kind of don't really notice when you are zoned out. And also the number of people, it's not just the cars. Here you don't have many people talking around."* (E25)

This feature of Windmill Centre, in addition to the favourable microclimate, highlights some important features of the spaces such as providing the impression of being protected from cars and noise. The design can also turn a post-earthquake area which is *"very open, [with] not much foot traffic and [located] on a busy street [which was] kind of a rundown area of town"* (E78) into a pleasant area, as per the example of the temporary site on South Colombo Street site.

3. AN EXPERIMENTAL CITY

The transitional nature of Christchurch since the February 2011 earthquake presented a unique opportunity to explore people's adaptation to the local environment (including its microclimate). The instability and changing nature of the post-disaster environment provided the ground for this investigation, and has meant that large parts of the city were experiments themselves during the research fieldwork. The following discussion is based upon the transitional character of the city at the time of this fieldwork and an intervention made in one of the case study sites. The transitional character of the city provided further reasons for locals to adapt to the climate as they reported to

want to participate and witness the redevelopment of the city. The intervention in the café provided an extra possibility of adapting and gave opportunity to observe its detail.

3.1. Transitional City

> Central Christchurch will change constantly over the course of its recovery. This transitional time provides opportunities to test new ideas, explore new concepts, and look at new ways to bring people, business and investment back to the city. It is also a time when the best use of available spaces must be considered and it will offer opportunities for the arts sector and community groups to get involved and support the recovery. (Canterbury Earthquake Recovery Authority, 2012, p. 97)

Due to the current nature of post-earthquake Christchurch, in many cases the interviewees mentioned the 'transitional' character of some sites as an important feature that influenced their choice to be in a specific place. *"As a Christchurch person you are becoming more used to the sort of what you call gap filler"* (E79). In these cases the users of the space said to like the area because of the *"innovation that is going on around Christchurch and how it is always changing"* (E69), and so it was described generally as *"attractive and inviting"* (E30).

Some users of Cashel Mall described the Re:START container mall as *"lots of shops built in or fitted out in containers, all really colourful so it's quite cool"* (E69). Some said to find it beautiful and *"a good way of bringing people back into activity doing something unexpected and colourful which attracts tourists"* (E80). And others described it as a *"getting there"* (E44), which is *"slightly mismatch, however the potential is there"* (E44).

South Colombo Street, the other emerging urban setting, has a different character. It is a little pocket park style area, which hosts a small café located in a kiosk and outdoors tables. Different from Cashel Mall, this area was described as *"a place you might be passing by and think of stopping [t]here"* (E79). A place that does not motivate them to *"go out of their way to specifically [go t]here"* (E79). One of the reasons also pointed out for that frame of mind was that, before the earthquakes, South Colombo Street – including Sydenham, the suburb – *"was not the place you'd thought of [going], because it was a fairly rundown part of the outer Central City",* but what has been done is *"quite a good idea given the situation with the earthquake"* (E79).

As in South Colombo Street, the idea that Cashel Mall is better now than before the earthquake has also been expressed:

> *"I personally think that Cashel Mall is better now. Although all the historical buildings are gone it's lighter and fresher and because down here before was really shadowed and was a bit dull and dreary. But it will be sad when they have demolished all the buildings, I think they need to keep a bit of history here, but I think this is much better now."* (E61)

The perception of climate with the temporary Cashel Mall has also been changed and improved:

> *"We lived in there just down from the Casino, in one of the little side streets around there. We used to walk around the town just in the evenings, but I always used to think that the City Mall was terrible. It was dark and the way that they have it now, with the Re:START is so much better. It's open and sunny, it wasn't done very well. So I mean it's a terrible thing what happened, but it hopefully will come back much better setup Central City for people to go and enjoy it, to go and have coffees and things. People didn't really go into the Central City much."* (E26)

The majority of users said they did not want the feeling of transition for much longer, however some said they like *"this funny feeling that it will still be here in 30 years"* and to feel that *"it's becoming a permanent thing"* (E33). Both in Cashel Mall where users said they *"wouldn't like it to stay any longer than probably another year"* (E44), and in South Colombo Street where it seems to be a demonstration of the current 'in between' times the city is going through, the temporary sites are described by many as a great initiative that has to finish at some stage not too far from now.

> *"If you say it's going to be permanent, it is going to be there forever, I think some of that interest would wane pretty quickly, unless you do a little bit more to it. Not necessarily a lot more, but a little more. And perhaps part of that is also about the buildings around it here. There is sort of that feeling all around here that some of it is now permanent, some of it you don't know and some of it is definitely not permanent. So right behind here, probably the whole next block, who knows what they are going to do with that."* (E79)

The current transitional character of Christchurch has at the same time provided the authorities with possibilities to test a variation of design solutions and stimulated the use of adaptive strategies by public open spaces' users. As users of these spaces highlighted, they wish to support the rebuild and the life in the city. If the current urban condition is not a definitive one, *"it's an interesting concept with the containers, and they just made the best they could for now"* (E32). Many respondents also highlighted they wish to witness the changes and be part of the evolution of the new Christchurch. These wishes and the reason for *being there* made locals handle the weather and microclimate in a special way.

3.2. Intervention: Blankets in a café

As the fieldwork evolved, I decided to do a short experiment of my own by placing blankets in Coffee Culture in Rotherham Street, one of the case study sites. During the winter 2012 I placed blankets in the open area of the café and did a series of interviews with people using these blankets. The intention was to explore if having some type of environmental control over the use this open space, as a way of adapting to cooler temperatures, would be an attraction to the site.

The colour of those blankets was very bright with the intention of attracting the attention of passers-by (Figure 50). Despite being positively evaluated because of the protection provided, it was suggested that it should be more discreet and in some cases the colour dissuaded the interviewees from using them. The café where they were placed was an urban social setting, but for lonely users of these spaces, it was still challenging to decide to use them, as described by an interviewee:

> *"No, it's cold, it's probably a little bit chilly to be comfortable, but they've got these kind of rugs which is kind of cute, so it's alright (…). If I was a little bit more unintimidated I'd just put it around and wear it probably, but is just it discreetly covering my knees."* (E51)

Figure 50: Blankets in Coffee Culture

It soon became evident that women by themselves and men – in general – were more resistant to use the blankets, as an interviewee who was not using them stated: "*they are nice and comfortable, but they are not for blokes, right? Blokes don't use it!"* (E22). This image of the New Zealander (especially man) as 'tough' (Wray, 2009) influenced the interaction with these blankets. People of more mature age and women in groups, on the other hand, seemed to use them without any problem. *"Many women used the blankets, some men with more than 50 years old and some Asians. Not many teenager boys or 20-50 year old men"* (field journal, 31 August 2012). Most men of more than 50 years old using the blankets were also interviewed.

It was a novelty in the site, thus some people thought the tables were reserved, that there was a school party, and in some cases that the blankets were beach towels (field journal, 22 August 2012). It was interesting how in some cases, the interaction between two customers who did not know what the protocol was prompted the use of the blankets. It seems that the approval by a peer makes it acceptable (see Blumer, 1969; vom Lehn & Gibson, 2011).

In addition to the adaption to climate and to the cultural protocols leading to using or not the blankets, an important perspective raised by some interviewees was the *point of difference*. In their

opinion anything that adds interest would make locals go back to places despite the disturbed post-earthquake environment because *"as business owners (…) they are looking into a point of difference… Something that they can really make them stick out from everybody else"* (E46).

The blankets prompted many interesting actions and reactions, including from children that wanted to use them because they were colourful. However some men used them discreetly covering their legs, especially men of more advanced years. Some people used the blankets to make the chairs more comfortable, some put them away, others used to cover their back or used more than one. Interesting comments regarding adaption to the indoor environment were also highlighted because *"when you get to the place it will be hot inside and the last thing you want is a down jacket or whatever when you are inside"* (E79). In these cases the blankets proved to be the reason why these people could stay outside during cool days when they were not fully prepared for the cold weather. If the spaces are overheated inside, the outdoor space has to provide a way of adapting with heaters, windbreaks, exposure to the sun and protection from winds or blankets.

Some interviewees who described the day as cold (RS6) said they *"would be fine if there wasn't that breeze, but [they] had the blanket on"* (E49) and therefore stayed for longer. So in a general sense the blankets extended the use of that specific space because people *"keep[t] wrapping [them]selves in it"* (E58). Regarding the current post-earthquake condition in Christchurch, where most of the places are facing some disruption, the blankets were said to add some novelty to the open spaces and *"that kind of difference would bring more people in"* (E46).

Some users of this case study site, however, highlighted that the social protocols hinder the use of the blankets and even though they were *"sitting [t]here and holding [their] hands because it's a bit cold, [they were] not used to that [using the blanket]"* (E46).

> *"I liked when I was going to cafes and bars in the UK, (…) and they actually brought the blankets out and gave to us, so it gives you more permission to use it, I was expected to use it. It is different from not knowing what the protocol was. And I remember to see people using in Copenhagen, everyone was using it. So I think, as a Kiwi (…) you feel like people are looking at you…. I think we should be grateful, so you don't need to carry a big heavy jacket and was fantastic. I don't need the jacket most of the time when I am walking or sitting down, but that was great to have it in the café."* (E74)

The quote above stresses that in European cultures the behaviour towards the blankets would be different. This illustrates what Fine and Beim (2007, p. 1) have entitled the *interactionist approaches to collective memory*, meaning that "the relationships among people as they respond to each other, create shared pasts and futures, and collectively negotiate meaning". The way the blankets were used (or not) in the public spaces and users' consciousness of each other, demonstrate what type of response they are likely to have with interactive structures. This insight can inform in what type of

space – probably the ones more used by groups – the users are more likely to take action. The challenges this experiment raises is how can these strategies be translated into landscape design strategies and to what extent they are or can be effectively used in urban retreat spaces – where people tend to be more alone – and in urban social spaces – where users are usually in groups and when lonely feel shy.

In conclusion, interviewees in general said the blankets extended the time they spent in open spaces, but in some cases, when the social protocol of behaviour was unknown, its use was limited. Users of the space tended to be more resistant to use the blankets when they were alone, on the other hand when they were with friends it was largely used. For this reason the majority of interviews that explored the use of the blankets were conducted with small groups.

4. SUMMARY

This chapter provided evidence regarding the way local people experience the climate; what means to be hot, cold or comfortable; the strategies they use to adapt to the urban (micro)climate; and the impact of the transitional nature of the city on the experience and adaptation to the climate.

The findings show there is a preference for cooler temperatures and the comfort is mainly dictated by exposure to sun and protection from winds. These preferences generate some strategies adopted by Christchurch residents to adapt to the highly seasonal and unpredictable local climate. The strategies were identified at the individual and collective levels and are undertaken either in anticipation or in reaction to the weather characteristics. The individual level strategies include checking the forecast (anticipation), choosing how to dress (anticipation) and making use of clothing layers (reaction); the collective level strategies include identifying weather and seasons for outdoor activities (reaction), choosing places for its microclimate (reaction) and choosing places for their social character (reaction). In addition, the adaptive capacity can be extended because of the current transitional character of Christchurch and some extra possibilities were explored through the blankets intervention.

The concept of urban comfort, central to this investigation, is dependent upon the process of adapting to the local climate and urban environment. In a temperate climate, adaptive strategies are needed to achieve the desired quality of life based upon the values attached to the physical and social landscapes. The local climate is not an extreme one, but the conditions in many days could hinder the use of open spaces, especially because of the cold and sometimes strong winds. The ability of enjoying the outdoors depends on adapting to the existing conditions (Nikolopoulou, 2001; Nikolopoulou & Steemers, 2003). The current approaches are insufficient to fully understand human responses to the outdoor climate (Honjo, 2009) and although new models have been developed in

the past few years (Bröde, Jendritzky, Fiala, & Havenith, 2010), including adaptive models (de Dear, 2004; de Dear & Brager, 2001; de Dear et al., 2005) the most common approach still focuses on individual physiological response.

Adaptation, however, is dependent on cultural background and collective values (Cresswell, 2004; Strauss & Orlove, 2004b; Tuan, 1979). In different cultures the environmental qualities that will make local people want to adapt to the climate – and therefore make use of adaptive strategies extending their adaptive capacity – are variable. The importance of adapting to the local climate is central when the issue is to be able to enjoy the outdoors, which implies both being in contact with nature and being social as most activities occur in groups. The next chapter explores possible reasons that underpin the adaptive strategies identified in this chapter.

CHAPTER SEVEN: Local culture influences on adaptation and urban comfort

Following the discussion regarding *how* local people adapt to the local climate, presented in Chapter Six, this chapter investigates the reasons *why* locals adapt to the local climate in a particular way. Our background and past experiences affect the way we perceive the world around us (Helson, 1964; Triandis, 1994). Triandis (1994, p. 14) highlights that "what looks good to one person can look bad to another, depending on the experiences that they have had". These experiences are also shared and influenced by the physical and social landscapes, and constitute the collective meanings and memory of shared cultures (Hough, 1990; Paasi, 2002).

The meaning of liveability in particular places is central to the understanding of local urban comfort, and in Christchurch the local culture and identity is highly influenced by the local physical landscapes (Craig et al., 1993). Meanings associated with the physical landscape affect the local lifestyle preferences and people's relationships between themselves and with the urban environment. The social landscape is in turn influenced by the values related to the physical landscapes (Cosgrove, 1984). Adaptation to microclimate and aesthetical preferences are therefore explored in this chapter in relation to the social and physical landscape values, within an overall consideration of liveability. This relationship is reflected on the ideal of a good city to live in. Although there are physiological variables involved on the thermal comfort perception, the meaning of being *comfortable* also depends on the individual and social adaptation capacity (Chappells & Shove, 2005; Shove, 2003; Shove et al., 2008). The capacity to adapt to the climate is influenced by the built environment, and will be extended if the user of public open spaces finds reasons for doing so.

As noted in Chapter Two, the difference between thermal comfort in an indoors and in an outdoors space is closely related to the type of stimulations each of these environments provide (Nikolopoulou & Steemers, 2003; Walton et al., 2007). Activities undertaken in indoors spaces are limited and usually assigned to a certain type of environment, making easier to adjust the temperature to the expected activity. In public open spaces the reality is different. In these open spaces the activities can have many different characteristics and things such as the number of people, the aesthetic and thermal qualities of the urban spaces influence whether or not people will use these spaces. The main difference between comfort in indoor and urban environments is that the second is not expected to be controlled and so people have ways of adapting to it if they wish to do so (Stevens, 2007; Whyte, 2001). The central question then turns to ways of extending the use of open public spaces throughout the year and what would make people want to adapt. Considering cultural backgrounds we could argue that what makes Latin Americans, North Europeans and Japanese

people want to adapt is different. While some cultures look for people, others look for peaceful environments as Knez and Thorsson (2006, 2008) observed.

In Christchurch, the outdoor values are a strong and important part of the local culture. It is learned early in life with family and at school, and most locals develop a bond with the natural environments. The geographical location of Christchurch, close to unique natural landscapes, provides the ground for the development of this dimension of the local culture. This collective meaning is expressed in the way locals socialise and preserve their personal space while looking for values brought from nature into the city. These aims for the ideal lifestyle influence the places locals search for in the city, also influencing how they adapt to the climate.

The results presented in this chapter are based upon the interviews and a map of the area where the interview was carried out, which was shown to the interviewees (see Appendix 6). At this stage of the interviews, interviewees were asked to highlight places and streets that they like or dislike the most in the area where we were. Microclimate and the social character of the settings were the main features of the space to be chosen, as presented in Chapter Six.

In the next sections I present the key reasons shaping local people's adaptation to the local climate. These reasons are related to the physical landscape, the regional identity, the social landscapes and the local concept of liveability. Local preferences for lifestyle and the meaning of liveability in the local context is an outcome of these interweaving concepts and preferences.

1. THE PHYSICAL LANDSCAPE AND REGIONAL IDENTITY

Hough (2002b, p. 180) has argued that "regional identity is connected with the peculiar characteristics of a location that tell us something about its physical and social environment". The physical landscape in New Zealand, and especially in Christchurch and its surroundings, have particular characteristics that help locals build their regional identity. These characteristics are related to the aesthetics of the country's natural landscapes, the rural and the urban areas.

New Zealand is internationally renowned for its natural landscapes. The natural landscape is present in the mind and memory of New Zealanders and is a reason for pride. The *100% Pure New Zealand* campaign is extensively marketed for tourism purposes expanding this concept to the world (Tourism New Zealand, 2013). In this research the main reasons for the high esteem of the local landscapes have been frequently related to its perceived naturalness – *"it hasn't been changing over the years. It is all kept as forestry and natural"* (E73). The safety context was also pointed out as an important reason for the constant interest on natural landscapes as *"[in other places] you wouldn't go and run*

around as if it was your backyard as we do here" (E69), and *"we are quite lucky that there's nothing that can hurt you in New Zealand"* (E69).

Regarding the peculiarities of the local culture – especially in respect to the outdoors and greenery – it was expressed that by living the whole life in the same place we *"don't take full advantage of it"* (E78) and *"take it for granted"* (E78). This impression was also highlighted when comparing the city and what it offers with other places and countries because *"it's only when you go to a country like China that you really value the greenery and the cleanness and the environment that we have here"* (E57). This was also said to increase the awareness about the need of *"do[ing] everything we can to protect it"* (E57).

Combined with nature conservation and safety, the geographical location and the possibility of being *"out of the city quite easy and quickly, [because] it doesn't take a long time to be out there in nature"* (E32) is a strong characteristic of the regional landscape that influences the local lifestyle. The proximity and possibility of safely enjoying the natural environment promotes habits related to the natural landscape that then become incorporated into the local culture. The collective reaction of people to the environment over time constitutes the regional identity (Hough, 2002b), which in Christchurch reflects values related to the outdoors. These values are then brought into the local lifestyle and consequently into city life.

Based upon concepts of regional identity, place experience and symbolism, the next sections discuss the influence of the local physical landscapes – geographical location, outdoor values and activities related to it – on the local identity. These concepts are central to the construction of urban comfort as they determine what is worth adapting to from a local perspective. This means regional identity, past experiences and meanings define what is a pleasant urban environment, and therefore worth adapting to.

1.1. From the Alps to the sea

It is very easy to go from the Alps to the sea in the South Island of New Zealand. The relatively short distances and the fascinating landscapes are the perfect combination to promote people's connection with nature. This connection was emphasised by many respondents as part of the country's culture. It is about *"how they see themselves as New Zealanders, and how they see the country"* (E64). In New Zealand and *"especially in Christchurch people in general are more outdoors and quite proud of that, it is all about the natural landscape"* (E64). The sense that the country is special due to its geography is also related to the notion that *"[in New Zealand] it is radically different from a country like United States where you might be close to lakes and rivers and streams, but for an entire nation to be that close to the marine environment is quite significant"* (E74). Craig et al. (1993,

p. 43) has attributed Christchurch's outdoor culture to its geographical location and the possibilities it opens:

> One of the factors contributing strongly to Christchurch's identity is the contrast between the specifically urban and cosmopolitan activities of the central city, and the diverse range of outdoor activities a short distance away. Additionally Christchurch serves as the gateway to many activities further afield, such as the Alps, the Lakes, the West Coast and the Antarctic.

Indeed, being the gateway to the South Island of New Zealand, internationally famous for extreme sports adds something to Christchurch's identity. The natural landscape that surrounds the city provides easy accessibility to the Alps and its ski fields and tramping facilities, and to the sea and its water-based sports.

> *"Everybody knows Christchurch has traditionally been the gateway to the South Island, it is interesting and a bit ironically really how Christchurch itself has been considered a gentle sleepy English style city on flat land, but we are really also seen as the gateway to all these things that are almost the antithesis of that. (…)."* (E79)

Clark (2004, p. 8) argues that New Zealanders identity remains "closely tied to images of the natural landscape" and points out that this is expressed through the enthusiasm of "getting away from the cities (…) and getting into the countryside and the wilderness". The attachment to the landscape is frequently seen as intrinsic to New Zealanders. Some respondents highlighted that this particular identity is frequently taken for granted. In the history of the country the background of Maori – the indigenous people – who have a strong connection to the land (Murton, 2012; A. Smith, 2010) was expressed as something that has been incorporated into pakehas' lives.

> *"I probably just took it for granted when I was younger. But the Maori culture has a strong sense of place in New Zealand. (…) When they introduce themselves to a public meeting they go through things like which is their mountain, which is their river, what they identify with (…). Now that I am a bit older, having spent most of my life here I have more appreciation for that than perhaps I did when I was younger. (…) The Port Hills as a landscape, even though I don't go up there as regularly as I used to, that's still part of (…) my landscape. It is the same with the mountains (…) like Arthur's Pass and Lewis Pass. (…). I think the landscapes are really important, even if it's more in a subconscious level."* (E79)

Some respondents referred to this connection to the nature as a New Zealand characteristic, others suggested that it was a difference between Christchurch and Wellington – a denser city – or Auckland – a larger city. Wellington, the country's capital, has almost the same number of inhabitants of Christchurch and is located in a region with completely different geographical characteristic, where most of its suburbs are in the hills. Auckland is the largest city in the country and has just over 1.3 million inhabitants (Statistics New Zealand, 2013b), also in a very different geographical condition from Christchurch and Wellington. The geography of these cities is part of the local identity and

influences the lives of locals. Wellington is the compact city, vibrant and urban with higher density. Auckland has its beaches and far away suburbs. And Christchurch is close to the Alps and the sea, offering a range of outdoor recreation and being the gateway to the South Island. The closeness to nature experienced in recreation activities is brought into the city and then a large extent of open spaces and greenery is expected. It is common for Christchurch locals to have a lower level of urbanity (Castello, 2010; Lees, 2010; Montgomery, 1998) and express themselves as *"not want[ing] to be too urban"* (E10).

> *"I like Christchurch compared to Wellington and Auckland (…) I always liked Christchurch because it's a smaller city, and the fact is that (…) we can live quite comfortably out by the beach, sort of be a little bit of country and then come into the city. That's what I've always liked about Christchurch it's not big and hugely populated."* (E27)

A respondent from Auckland who had been living in Christchurch for just over two years at the time of the interview was asked if they use to develop outdoors activities more in Christchurch than they used to do in the North Island. Their comment highlights how the affordance (Norman, 1999; Turvey, 1992; Xenakis & Arnellos, 2013) of the environment affects the local lifestyle:

> *"[In Christchurch] Somebody organizes it, so you just turn up and go, whereas in Auckland it was far more of a drive to organize something and so I did a little bit less up there than I would down here. Here everything is closer and that seems to make a difference".* (E75)

They were also asked about the perception of the outdoor as part of the local culture:

> *"Maybe not less of a culture [in Auckland] but in Christchurch there is no city culture yet. So your options are to enjoy yourself and go away and go walking in the bush and enjoy the outdoors, because it's pretty much all there is".* (E75)

This respondent had lived in Christchurch for around four years prior to the earthquakes. Their personal impression was that the city had more things to do but has never had the ambition of being a big centre. Thereby the connection with nature is kept strong, and for Christchurch people it has a very particular relaxed and spacious atmosphere even compared to other cities within New Zealand.

> *"I haven't really been in many places, but I've been to Auckland twice and that was just too busy. You couldn't stop to see anything, so I don't even remember seeing anything like what you see if you go into the city here (…). I can't even think about Auckland, because it was just so busy there and everyone is just rushing around. (…) Not as relaxed as people are here."* (E47)

The geographical location allows locals to be frequently engaged in outdoor activities, and for that reason values attached to the outdoors are developed and incorporated into the local culture.

1.2. Outdoor values

Outdoor values are closely connected to the physical landscapes. These values are brought to the city and affect what people expect from the urban environment. These shared values are closely related to the way locals grow up, the school education, the meaning of outdoor activities and the relaxed and peaceful atmosphere in and around Christchurch. Among the reasons for preferring a certain type of lifestyle are many individual variables such as age, marital status, having children and so forth. But the collective meaning of the natural landscapes and being close to nature are very evident across the different groups. Respondents highlighted some factors that make New Zealand and especially Christchurch unique regarding its physical and social landscapes. The results are mainly based upon views from those native to Christchurch, but it also includes some non-local perspectives that highlight cultural differences helping the understanding of particular aspects of local culture.

The background, the way the respondents grew up and the family activities – which are strongly based upon the outdoors – seem to influence the cultural value for the outdoors. Because *"you grow up in a certain environment and you sort of figure that this is the norm until you move away"* (E76).

> *"(…) because people and families like to go to the gardens and have picnics… That's how I've been brought up anyway, go[ing] out and do[ing] activities. I like going to the Gardens all the time. Although I'd like to see more (…) parks around like big ones, especially in the suburbs."* (E49)

Besides preference for living out of the city, the importance of a peaceful environment and close connection to nature, the regional outdoor culture highlighted by the respondents featured opportunity for recreational practice and backyard space within the city.

> *"(…) it's also something you grow up with. We are always told that New Zealand landscapes are important and significant, that it's beautiful (…). And I think Christchurch people in particular, especially people that lived here a long time are quite aware that we are quite lucky that we live in a city (…) but yet we are close to different types of landscape all within a short space, and while Christchurch itself is on the largest plain of New Zealand, we are still very close to hills, mountains, rivers, we have a few lakes nearby, we are not that far away. (…) We have flat lands, so we've got (…) a lot of parks where you can play your traditional sports, but we also are close to a lot of all that other stuff that some of the other cities don't have as much. (…) Christchurch is a good city for those things, and when you stop and think of those things they do involve landscape. You can't do a lot of those things without having the right landscape."* (E79)

The fact that locals are *"brought up with the '100% pure New Zealand'"* (E69) also was said to make *"everybody identifies with nature in New Zealand"* (E69). In a general sense Christchurch people prefer a relaxed atmosphere, and even though many people like the urban environment, the outdoors is considered *"part of our upbringing and it's really important to kiwis to be out and about and be able to enjoy the outdoors"* (E63). The traditional activities, especially during the holidays

include family camping and some people reported to have stopped doing that since they moved away from the parents or family.

> *"The thing in our family is that every year we go camping, like in tents. It has to be in tents, and (…) we are not allowed electricity. It's kind of… More what you've grown up with really I think. Some people might be completely different."* (E53)

The traditional outdoor lifestyle that makes people in Christchurch be connected to nature is enhanced because it is part of the lives of locals from their early years of life. The school system in New Zealand plays an important role in developing outdoor culture. Schools have in their curriculum a discipline called 'outdoor education' which usually includes field trips and camping. Then *"even if your family is not too into the outdoors, because of the school system you get to experience it"* (E74). This means that *"when you are growing up, you would do a lot of school trips to mountain areas, and learn about nature and how to preserve yourself and even how to survive in the wild"* (E68). *"You are taken out and you go camping and you have to go sailing do quite a lot of pretty 'out there' outdoors things really"* (E74). In these courses the students learn *"simple things like cooking a meal over the fire (…), building a wee tent, learning how to cross rivers"* (E68). The attachment to nature is valued at school since early ages, and then interviewees said they find *"the nature side of things very important"* (E68).

> *"As a kid in Greymouth we would be taken to Arthur's Pass and we would go up to the snow. It's pretty insane when you look back at it, ten year olds kind of climbing through the snow on slopes… [The inclination] Feels like 45 degrees."* (E74)

The children's connection to natural landscapes and how they respect and connect to nature in a very special way was also highlighted by foreigners:

> *"It seems the majority of Kiwis were born with it, since their young age the parents already take them into the nature. So it seems to be part of them. A Brazilian does it once every five years and finds it amazing, but it is not a normal activity, it is like an event (…) it is different here. The amount of three or four year old children that just started to walk and are there with a backpack. Or sometimes you see babies that are just months old and are already there, attached to the parent's back. So New Zealand is very special in this way."* (E56)

In some cases the non-local people highlighted the cultural differences noticed when they arrived in New Zealand, as their own cultures prioritises different values and activities. In some cases it was said that because your *"parents do not have the habit you don't do it"* (E42), but when you are immersed in a new culture with different habits you *"start to want to be involved in these activities"* (E42). In these cases the New Zealand landscape was also said to play a significant role on prompting the wish to be close to nature because some foreigners *"came to New Zealand because of the*

nature" (056), because it is indeed different. These values are brought into the city and influence the self-image of locals:

> *"People who live in Christchurch or on the outskirts of Christchurch are more outdoor people than people that live in Auckland, who are [in a] big rush, 'gotta get it done' business people. We are a bit more relaxed (…), so I think it's kind of breed into you if you are from here. (…) If you want to come here, that's what you are coming here for, is to see the sites… (…) That's what it is… It is 'go and have a look', it is [about] walks and tracks and things like that… It's breed into you."* (E47)

This self-image of being outdoor relaxed people is also manifested in the way Christchurch people chose to spend their leisure time, including recreational and gardening activities.

1.3. Outdoor recreation and gardening activities

The outdoor culture is also important when choosing recreational activities which are largely expressed as outdoor recreation and gardening. Accessibility to the outdoors, preference for living out of the city, the importance of a peaceful context and connection to nature, opportunity for sports practice and backyard space are important.

Outdoor recreation

The connection to the outdoors was expressed through the practice of sports and recreational activities. In the 86 interviews at least 19 different modalities were mentioned: soccer, cricket, four wheel drive, kite surfing, diving, fishing, hunting, cycling, motorcycling, netball, golf, horse riding, kayaking, sailing, ski, tennis, snowboarding, rock climbing and tramping all of them practiced outdoors. Furthermore there are the frequent outdoor runners and walkers, stressing the extent to which outdoor activities are present in locals' lives.

> *"I've got a boat, like fishing and hunting, tramping, I like mountain biking. I used to, but I don't have time for camping these days (…). I've got a property in Harewood which is a five acre block but I do have my own engineering business (…) and I am not outdoors as frequently as I would like. Well, I used to get out a lot, used to go hunting every weekend or every second weekend I'd be out in the mountains."* (E22)

Sports were also frequently remembered as a way of socialising and when described by sports people, highlighted how the activities influence their general perception of the local climate. When respondents were asked if they find Christchurch windy, the kite surfer said it is *"not always windy"* (E15). In their perspective if it is windy but it is a nor'wester it is not good. The nor'wester, which is for most people a strong but nice warm wind, for the kite surfer is worse than the easterlies, because nor'wester if off shore and therefore they cannot enjoy the sport. On the other hand, cyclists find it

very windy and described the sensation of cycling against easterlies as cycling *"into a brick wall"* or *"in wet glue"* (E33).

Activities like barbecues are also part of the local warm season events. It is seen as another part of the culture and a reason why it is was said to be difficult to live in apartment, because one needs to have *"grass, just to have barbecues, barbecue is a big part of our culture here, and [we] like having room to have lots of people over"* (E61). The relationship of these activities, especially the barbecue with the climate was also described:

> *"We are definitely a culture that if it is sunny then we will be happy, and if it is bad then I will be depressed. Whenever it is sunny everybody has barbecues and drinks beer in the sun and… Yes… When it's not like that then we don't like it."* (E67)

Other activities developed outdoors that were frequently mentioned as part of the local culture were camping and picnics. In this sense, the experience of climate was explained to be dependent on what people are doing outdoors, because *"if [you are] doing something active it would take quite a cold day to stop [you]"* (E79). Another important factor is commitment, because *"if it is something that you commit to, like a team sport, soccer or football, unless the game is called off because you have a week of snow, nothing really stops you"* (E79), but if it is an unpleasant day and *"you are at home, [you] wouldn't go out for a bike ride"* (E79). On the other hand even an imperfect climate can be a motivator for specific activities as it was also said to be a factor to engage in some activities such as *"running in the rain because everyone goes away"* (E74).

In a general sense the outdoor activities, constantly present in locals' lives, are largely affected by the climate, and therefore also influence their experience of, and adaptation to it. The practice of sports in and out of the city is an example of that phenomenon, as a large part of these sports are seasonal and take place according to the climate conditions. Respondents highlighted that *"sports wise"* (E77) the climate shapes what they can or cannot do, therefore they *"tailor their activities to the weather, so in the winter [they]'d spend a lot of time snowboarding and in the summer going to the beaches"* (E75). The same way some respondents explained they substitute sports such as *"snow skiing"* in the winter for *"water skiing in the summer"* (E72), or snowboarding practiced in the winter for wakeboarding during the summer (E46). Gardening activities have also been added as a seasonal substitute for outdoor sports, as some respondents highlighted that they *"go skiing during the winter and in the summer [they do] gardening"* (E14).

Gardening

Gardening is also an activity associated with the symbolic meaning of belonging to Christchurch. Most respondents live out of the city in properties with surrounding space or they at least have a

garden. After the February 2011 earthquake the meaning of having a garden also turned into security and resilience. In a country such as New Zealand with a high seismic activity, more private space can increase resilience:

> *"I think it is a problem for a town this size. I think it is understandable when you look at China (…). But people in this country buy their quarter-acre section for a reason, because they have grown up with that, and that is in their blood (…). In these terrible times, there is so many people doing their own little vegetable garden, if that is gone, then what else?"* (E44)

The presence of gardens and their importance for local culture is so strong that *"people are very proud of their gardens and there are garden clubs in every suburb where you go to once a month and they have speakers coming, competitions etc"* (E40). As promoted by the Christchurch Beautifying Association, gardens are present everywhere and *"everyone has a garden"*, because *"we don't have many high rises and apartment buildings, everyone lives in their own section with a garden"* (E40). Even some respondents that chose denser lifestyles tend to 'accept' that type of life as long as you have 'some' garden and enough privacy.

> *"I think there's no reason why [higher density] wouldn't work. I live in a town house (…) and I have a rear courtyard that's not very big, it's quite intensely divided and my lawn takes about 10 minutes to do. But I think providing there's no danger of sun being blocked out or people being able to see into my private area, that way of living is quite acceptable."* (E57)

An interesting point is that even people that see themselves as *urbanites* – who grew up and still live in the city (Tittle, 2001) – because they enjoy the urban life and would not like to live in a farm for example, still said to have their favourite activities in places reasonably isolated from the Central City. Many interviewees also said they are not *"sort of an extreme outdoor person, but quite enjoy going for a run or for mountain biking"* (E32). In this sense interviewees that consider themselves urbanites also enjoy being out of the city.

> *"Yes, I am [an urbanite], but I come from like a small place with land, so I like both. But if I am in the city I want (…) [to] have access to what it offers (…) but then I can go away from it."* (E43)

Respondents who claimed they did not have time for gardening, said they at least had small areas for herbs and vegetables:

> *"I don't like maintaining grass, however if I don't have it, I'd be very upset. (…) But in my vegetable garden we had broccoli and things like that. I lived in a flat in Dunedin, and I had a tiny patch, so I just planted herbs in one edge, and vegetables in the other and that kept me alive. So people need it."* (E44)

Some believe the Garden City image is indeed related to the private gardens and that the idea of a Garden City is also attached to private house gardens as they collectively generate the aesthetics of the Garden City.

> *"I think the most important thing is how individual households keep the image of it. When I go to the North Island, or any other city for that matter, I definitely can see the difference in people's gardens. People don't really care about their gardens, just have like one shrub, one tree and things like that, whereas people in Christchurch, because we have that Garden City image, everybody try to keep up with that, and everyone really cares about their garden."* (E30)

Therefore, Christchurch developed with a large appreciation of the local gardens by its people. McNaughton (2009, p. 48) for example, has argued that in Christchurch the garden is an 'index of civility' and Longhurst (2006) adds that in New Zealand as a whole 'plots and plants' hold huge social, cultural and political significance, and affirmed that since the 1980s people have become more aware of risks associated with climate change – and a way that people can ease their anxieties is to retreat to their home and garden.

> *"(…) [gardening] for every second or third day is the sort of thing I quite enjoy and it gets you outside especially now that I've got a job when most of the time I am inside and I often don't have as much time now to do outdoor activities as I used to do when I was a bit younger and then gardening is a substitute for that. It is a chance to get outside in the weather, in the sun and even though it's not hard exercise, I quite like it."* (E79)

In accordance with McNaughton (2009) and Longhurst (2006), another aspect highlighted in the interviews was that the appreciation and requirement to keep the gardens tidy is reflected on the image attributed to people. A foreigner interviewee living in Christchurch for nearly seven years when asked if there was any street that they had a memory of being greener or more beautiful than others, described:

> *"I've been to Auckland. I lived there for maybe around three months. Auckland is a very crowded city, if you are renting a house, you'll spend a large amount of money for that so people don't spend money on the gardens. In a small land you can build a better house, so you don't see the gardens in Auckland. But here if you have a house and your garden is a mess your neighbour will say 'I don't want to know these guys'. There is something here very particular."* (E23)

The combination of 'making the most' of public spaces by making them greener was stressed as a point of difference in Christchurch, which should be explored to add value to the city. This interviewee in Sydenham highlights this aspect of the future of the city.

> *"Connections… So maybe they could build a little walkway to the mall, or you'd have a couple more restaurants or cafés around here that could create a little nice area. A bit like those old places in Europe, in those urban environments where you have little*

> *plazas [that] often at the ground floor level (…) are just a whole lot of cafeterias and bars and restaurants. Then this place will be cool, and if you do a bit more to it this could fit with the Garden City approach as well. So other than having 500 year old pavements, like they do in a lot of those old European plazas, our plazas would be more green and more flowers and native bush."* (E79)

So far, the importance of gardening discussed in this chapter is related to the aesthetics and self-identity. However the activity also increases the awareness of seasons and its meanings. Seasonality has a meaning in the daily life and the perception of time, as described by Olwig (2005, p. 269):

> The logic of the absolute geometric space of the map and central-point perspective prospect, and the chronometric time of the calendar, is qualitatively different from the liminality of place and seasonal holidays. In the latter case, it is the content that defines the seasons, not the regularities of a quantitative system of measurement.

In Christchurch, the constant presence of public gardens and the importance of private gardens, that requires their keepers to know the best seasons for flowers and vegetables, influence how locals perceive and how much they know about the local climate. The perception of seasons related to the garden is an evidence of how the local minds are *setup* regarding seasonal changes as an interviewee described how they know the seasons have changed:

> *"It's not so much a date or anything, but it's actually the climate patterns that change. It's when you see the length of the days affecting the plants (…). And this last year I got thrown out… You know they can chill daffodil bulbs and make them early starters so you see it's spring, daffodils are out, and then you realize that you have been tricked (…) The blossom trees around Hagley Park are [also] a gauge of what is happening. You know what is happening rather than bothering to work out when summer is. I don't know when the summer actually starts, it's all on the trees."* (E76)

This experience of changing seasons has been expressed by locals who like to see the landscape change according to the seasons and feel the consequent different temperatures and meanings:

> *"I like the snow, I love the snow. I was talking to someone and the person was complaining about the cold weather, but can you imagine how boring it would be to live in the west coast of the US, in California, or just in a place near the equator, where there's no season change? So the plants don't change, and things are the same all the time! We are quite lucky in here."* (E76)

The greenery influences the wish to be outdoors, having the potential of influencing adaption to the seasons, and the appreciation of the greenery in urban landscapes is related to the local climate. When asked what an interviewee thinks about the greenery in Rotherham Street, they said:

> *"I think it's pretty good, especially in the summer. People tend to appreciate the garden sort of atmosphere more in the summer when it's a very nice weather and you are sitting outside and that sort of thing. But in the winter I don't really notice it.*

> *(…) I guess when it's cloudy you don't really notice. (…) But when it's a nice day or the sun is out I might realise it more… Look at these nice plants."* (E49)

Finally, the characteristics of the local climate and what is understood as *comfortable* in human physiology proved to be insufficient to understand the local attitude towards the climate and the patterns of use of public open spaces. In this sense adaption to the local climate provides conditions for the local people to enjoy open spaces for a longer period during the year. The willingness to adapt is a consequence of the habit and desire for being in, and with nature, and engaging in outdoors activities. In some cases the gardening activities are seen as a summer substitute for the winter sports as some people do *"a bit of skiing during the winter, and in the summer gardening, it is not sport but..."* (E14). Therefore the regular outdoor activities, such as recreation and gardening, have a particular and important influence not only on adaptation to the climate, but also on the type of city locals' desire.

2. THE SOCIAL LANDSCAPE AND LIVEABILITY IN CHRISTCHURCH

The importance of liveability in the scope of my research into urban comfort is that the adaptive capacity to microclimate can be extended if people are provided with reasons to adapt. Therefore, the full understanding of local concepts of liveability is fundamental when designing spaces to enhance urban comfort, as urban features and aesthetics that provide stimuli for adaptation are variable across cultures.

> *"To me as a Christchurch person, quality of life does include those things of having a bit of space, have a bit of peace and quiet when you want it, having access to good housing, having access to good facilities, amenities and public places, and I think Christchurch has always been really good like that and I think if you'd go to other cities, like bigger cities and more global cities there are other aspects of quality of life that you gain, but you lose a lot of that stuff. Christchurch has also by large been reasonably clean (…)."* (E79)

The question of what is a liveable city is directly related to how people want to live. This ideal way of living is variable across cultures and the type of relationship a place has with nature will influence the social values of that culture (Cosgrove, 1984). In New Zealand, the connection to the natural landscapes provides the basis for the regional outdoor culture (Bell & Matthewman, 2004; Wray, 2009, 2011). The wish for open spaces became evident in this study of Christchurch, where the strong bond with the natural landscapes influence the attributed value to the built ones. As a consequence, being able to see and feel closer to natural landscapes – which implies lower density – is reflected in the expectations of urban environments.

> *"I don't think it would be a good idea to be like that [denser]. Why? When you don't have to? We don't have to be like that. We could be even greener than we were*

> *before, because we have the opportunity… You've got the land too now, you can't do anything else with it, so why make it really dense? I don't think it a good idea"* (E47).

In addition, the good city should also provide choice for vibrant spaces and places where there is still opportunity for personal space, indicating that the *social landscapes* are a product of the collective meaning of the regional natural landscapes.

> *"Having travelled a bit to other cultures where people won't go into a place if there aren't lots of people – because it is obviously not good if there aren't lots of people sort of idea – I think a lot of New Zealanders and Christchurch people are certainly a bit the other way around, but maybe it comes back to that landscape thing. The fact that we are used to being in beautiful spots where partly of what makes it beautiful is that people haven't built buildings all over it, that every day there aren't thousands of people there and the impact that it has on the landscape (…). We know that part of the reason why it is so beautiful is the lack of people. So I guess that gets into the urban environment as well, (…) people would go and think of not going into town because it's likely to be busy, and you don't really want that."* (E79)

The respondents of this research highlighted the *"village feel when you bump into people you know and say hello"* (E74), and people described themselves as liking *"sociability but not so much being packed with strangers when people aren't really interacting or having meaningful interaction"* (E74). The desired number of people in a certain place is also highly dependent on the type of space and activities that place offers. Public open spaces have been classified in this research as urban social and urban retreat spaces (see Chapter Five). In some cases interviewees favoured larger numbers of people (in urban social spaces) and sometimes they preferred fewer numbers (in urban retreat spaces). As previously discussed, in places where users have more personal space their connection to the environment[30] itself – including microclimate – is more significant. On the other hand when the users choose to be with people, people being the reason for choosing the place, the social landscape becomes an important factor enhancing the capacity to adapt to the microclimate.

2.1. Garden City as a way of living

The preferred way of living described by respondents is closely related to the *Garden City* ideal which is based upon the idea that human society and nature are meant to be enjoyed together, and therefore town and country must be very closely related (B. Clark, 2003; Howard & Osborn, 1965). Locals tend to like a quieter atmosphere, low density and less people. These qualities are taken from the natural landscapes and the spaces in the city are seen as good spaces as long as the keep up with these qualities. For these reason low density was extensively described as preferred. The local level of urbanity seems to be influenced by the rural and urban connections, in the sense that people that live outside of the city or *"almost on a farm (…) don't like the height of the buildings"* (E12).

[30] *Environment* in this context regards all the environmental qualities of a certain place involving both aesthetics and comfort, such as design solutions and finishing, greenery, light, noise and climate.

Historically New Zealand represented to the first settlers the reconciliation between the city and the country. This was a perfect place to live because nature could be brought into the city and it was represented by the quarter-acre section typology previously explained. Christchurch is known internationally as *The Garden City* (Christchurch City Council, 2013), and is often considered the most English city in New Zealand. This reputation adds to the pride of residents and is a touristic attraction (McBride, 1999; J. Wilson, 2005). For this reason, the desire to see the city redeveloping in harmony with the Garden City image was articulated by many respondents. Results of this research show that for many Christchurch residents, urban liveability still implies a lower level of urbanity compared to larger urban centres. This was demonstrated in respondents' accounts through a belief that town and country are, and should be closely connected, and that the social environment should be integrated with its natural surroundings.

It has been pointed out by interviewees that a feature of the physical landscape that provides the right conditions to be a Garden City is that *"we are a lot more flat as well, which makes a lot easier"* (E46). The combination of geography and policy makes it the Garden City:

> *"Often new subdivisions have a pocket on the corners that have flex and native bush. So I think it is part of our culture to try to maintain that, there's a conscious effort to make sure that you are building a new subdivision but it isn't purely houses, that there's space for people to have a bit of gardens. And even though in these newer houses the properties are smaller and the houses are often bigger, especially in the wealthier ones, there is still that element of having gardens. In fact often it is a requirement for the person buying the house and building that they keep the garden."* (E79)

The wish of seeing the rebuild improving the image of the Garden City was also highlighted.

> *"I really like the idea of the Garden City, the ideology is really good. Obviously to have plants and flowers around is good, but I wouldn't say we used as much as we should. We go on and on this thing of being the Garden City, but how many people actually walk through Hagley Park every day? It's not central. Where I am from in Invercargill we had to bike through the park to get to work and back again home. (…) But yes, even in people's houses, a lot of people take a lot of care of their gardens."* (E31)

In a general sense, the earthquakes changed the urban landscape and also how local people see their city. But the *"the cleanness, the greenness and the gardens"* and *"the pride that people take on it"* (E57) add to the image of the Garden City.

Christchurch's geographical location makes feasible the constitution of the Garden City. Due to the affordances provided by its geographical condition (Norman, 1999; Turvey, 1992; Xenakis & Arnellos, 2013), the local lifestyle and culture are reflected in the urban environment which is expected to provide a reasonable level of peacefulness – found in nature – and a large amount of greenery in the

city. The expected amount of greenery also seems to influence the adaptation to climate. Even on cold winter days, indoor workers tend to choose to go outside for their breaks, provided there is *"some greenery around or a tree to sit under"* (E27). The largely described perspective of an ideal city is the one that has *"lots of green, plants and grass, it can't be a concrete jungle"* (E31). Respondents also highlighted the importance of greenery on making you cope better with unpleasant climate:

> *"[Christchurch weather is] a bit dull in the winter, it can be quite bleak, lots of cloud cover. So I think it's very important that we keep some of our gardens in the city for example, (…) [because] it lifts you a little bit (…) It's not all concrete. [We need] at least some garden areas within the city (…). I think that's really important, especially in the middle of the winter."* (E27)

The potential impact of greenery on adaptation has been highlighted by an interviewee in Windmill Centre who pointed out that *"If there was the same amount of wind [in Windmill Centre] than in town (…) [they] would probably prefer to be in town"* (E08). This observation was due to the fact that the Central City was said to be more attractive and pleasant, so providing a reason to cope with the undesirable climatic conditions, in this case the wind. The effect of the Garden City was also expressed on the daily activities, such as walking. Most respondents said the weather conditions do not *"bother"* them, *"but [they] do prefer to walk out where there's trees"* (E27). In this sense *"really nice green spots, with some benches and things"* (E11) were said to be the ideal to spend time with friends.

A different perspective related to the Garden City way of living and which also has an influence on locals adaptation to the climate is the farming identity of the South Island of New Zealand and Christchurch. Farming has been the main economic activity of the country for generations, being still a major economic activity along with tourism. The ideal of living outside of the city, translated into a demand for lifestyle blocks[31], generates in many cases a country living sustained by urban employment (Fairweather, 1996). This type of lifestyle, in addition to the geographical characteristics of Christchurch and its Garden City identity, was highlighted as a factor affecting the perception of comfort, as a respondent explained:

> *"A lot of Kiwis especially in this place are used to be outside in the cold (…) a lot of our activities are based in the cold, you are considered a bit of a wimp if you are not going to go out and do the thing because it's just not that hot. Just get out there and do it."* (E79)

As in the lives of farmers, people who live in lifestyle blocks, or in houses with vegetable and flower gardens, they were pointed out as the reason for being aware of the seasons and therefore knowing

[31] *Lifestyle block*, as it is known in New Zealand, is also known as 'hobby farm' in other countries. It is a small farm maintained for recreation without expectation of being the main source of income, although some can generate an additional profit. It is more a country home than a business.

what to expect. It was highlighted that before moving to this lifestyle *"the weather used to be 'out there'",* but having to deal with the farming activities *"has radically changed how [they] observe the weather*" (E74).

> *"So the farming makes a difference. There's the two things: There's the animals and then there's the vegetable garden. With the animals I always need to know whether it is going to rain so the goats are in the paddock where they have shelter, and I feel like I have a really good idea of what the weather is like throughout the day every day basically because I have to go out and check the animals and I have to decide what I am going to wear, because I always have to change clothes to do that (…). So I am making a lot of different decisions of exactly how many layers and what type of layers I need. I am [also] always watching through when the frosts begin (…), it's a big thing when we decide to cut the hay. It's a really stressful kind of week (…). Is it going to rain?! It is allowed to rain once the hay has been cut but not once it has been taken off (…) But you also don't want really windy days until the grass is growing and it's always factors that have to be taken into account. And I use Met Service much more than I have used to have the rural seasonal outlook. [Regarding] the vegetables I have never been aware about the seasons, realizing when I actually have to put seed in for it to be right in the summer (…)."* (E74)

The above quote highlights how much the rural activities make people aware of the seasons, the weather changes and the forecast. Because of the cultural value of the landscape and the self-identity as the 100% pure country, New Zealanders and especially Christchurch – because of the geographical condition for outdoor activities – value activities and lifestyles that have strong connections to the nature. Depending on the activities locals get involved in, the proximity with nature prompts a response to the seasons and the weather. Although in general we feel *"more motivated to go and get out and about in nice weather or when it's warmer, being in forestry you don't have a lot of choice. We are still out and about in the forest in the rain and in the snow"* (E69).

Landscape was described as a *"major breaking area"* in the sense that it *"makes the space far more pleasant"* and *"even a minimum amount of landscape, it is better than nothing"* (E14). The idea that post-earthquake Christchurch has *"a lot of area that could be turned into something which is functional, pleasant and has a landscape balance to it"* (E14) was frequently considered. In a general sense there is a need for peaceful spaces and 'fresh air' within the city, characteristics that simulate the qualities found in nature. Locals also like a large amount greenery which is seen as a great quality of the environment, motivating them and making them want to stay outside and adapt if needed. In summary, the Garden City way of living is an important feature in terms of local pride and identity. Hence the presence of public parks and green areas throughout the city is an important feature that makes residents want to go to and stay in public open spaces.

Types of people and spaces

How locals make the choices for places in the city (discussed in Chapter Six) is strongly connected to the type of people they are and the activities they engage in. For some interviewees urban retreat spaces are more attractive and for others the urban social spaces are the place to be. Social spaces are desired, but the level of 'crowdedness' locals aim for is very low. In many circumstances places that were reasonably quiet by international standards were considered busy in a Christchurch context. This ideal of privacy was reflected on the use of the case study sites, where the choice for where to sit was related to personal space (Sommer, 1969). Some frequent customers of the case study sites have their favourite areas and seats, and it was said to have been chosen based upon *"having more space"* (E45) and *"wind shelter"* (E46).

> *"As a Christchurch guy I tend to think of going to a place more 'standalone'. So in my area of town I might be going down to the Coffee Shop at the bottom of the hill near the river, where there's no other shops around (…). If I was thinking about going to a place for a coffee or just for a drink, or to sit down and chat to somebody I'd automatically think of going to a place that is away from the shopping malls which I guess comes back to what you are asking about in terms of climate and landscape and things… For a beer I'd also go to a place like that (…) unless you are going out because you want to see more people and it's that time of the day… (…) But especially in the middle of the day, if you are thinking about just going out for a drink and enjoy the sun and sit in a pleasant environment I'd probably think more of places that are attached to nice areas that I know that might have an outdoors area that you could sit in the sun if it's a nice day, or near the river, or the beach, or the hill… Which I guess comes back to your landscape thing… I am not particularly interested in going out of my way just to seat and see other people…"* (E79)

Another difference between the urban social spaces and the urban retreat spaces that was highlighted was whether the intention was meeting friends or just having some quiet time. Many interviewees in the urban social spaces were waiting for friends when they agreed to participate in this research and the most commonly expressed idea was that if they were by themselves, they *"would probably look for quieter places (…) but if [they] were going out to have fun or something [they]'d go somewhere where there's more people"* (E78). This is to say people by themselves *"quite like having [their] own quiet space, but if [they are] out with people, with friends or colleagues, then [they] generally go to more people-orientated places where you can have a good time and talk to new people, and meet people"* (E39).

Therefore, one might naively think that in planning a vibrant city, quieter places are not necessary. However, certain types of users are attracted by urban retreat spaces and they are not the same ones who are attracted by urban social spaces. This is particularly the case of elderly people and women alone (see Chapter Five). The Windmill Centre is a good example, as it is located one block away from Rotherham Street, but a large number of respondents expressed that they go frequently

to the Windmill Centre and avoid as much as possible the busy social settings that surround Rotherham Street and the Mall.

Age is another factor that influences how people feel in a certain space. Different age groups are focused on different things in the urban environment. Whereas some younger people said they like to *"see people"* or *"people watch"*, older people said they *"go to the quieter places, so we can actually talk"* (E67). And when choosing the type of place they go to it was expressed in several interviews that they *"are not going so much to the loud places with all those good looking people anymore, we just want somewhere to sit down"* (E67). Some respondents said they dislike malls and busy places because *"you like and need your personal space especially as you get older"* (E62). These qualities of space reinforce the idea that different types of people look for different types of environment in the city. If the intention is to provide liveability to all city dwellers the requirements for these varied types of environments have to be provided.

In different circumstances and with different interviewees, the preference for more or less people is usually related to the activity being undertaken, as for workers and business people in lunch breaks, for example.

> *"If it was all packed here I wouldn't come (…). I would choose to go somewhere else because it's your lunch break, so you kind of want to be a little bit quieter (…). There are other circumstances too… You are limited on time because you are on a lunch break or whatever… There is always something that stops you from doing that or going there [to busy places], whereas if it is like this [quiet café] it doesn't really bother."* (E47)

The perception of crowdedness was also frequently mentioned by participants. In Christchurch *crowds* do not necessarily imply a very large number of people, but rather enough people to interfere with their personal space, which is highly valued. People tend to prefer *"more personal space"*, and said to *"love being with people, but [they] just don't like being in crowds [and they] do like a bit of personal space"* (E54). The fact that *"we are quite lucky here that with not much difficulty we find places to go and not be crowded"* (E57) was also highlighted in comparison to places with higher density.

> *"I've spoken to Japanese people that use our parks and our facilities here and they just think it's wonderful because in Tokyo for example it's impossible… There would be people having picnics in any available piece of grass. That's not like that here, where you can relatively easily find a spot on a river bank or in Hagley Park without having a lot of people around."* (E57)

Crowdedness affects the way the environment is experienced. The numbers of people is seen to change the essence of place, especially when peacefulness and solitude is its main special feature.

> *"I've been to the top of Santorini (…) hundreds of people everywhere… In New Zealand you just go and you can see it on your own. You can be in a nice place such as Milford Sound and you can be on your own. You know…. Freedom, you can feel the majesty of the whole place and not feel crowded out, not feel like you are rushing to queues everywhere… We don't have queues everywhere!"* (E65)

As previously discussed, adaptation to the urban microclimate is affected by the presence of people or friends, and the built environment itself affects the experience of climate. Urban density is one of the factors contributing to this experience.

> *"I find Christchurch way quieter than other cities, they always seem too busy. I guess climate wise you don't feel the cold as much in those bigger cities because there is so many people, and so many more buildings, and so much happening that you don't have a chance of feeling it as much, whereas Christchurch is so much more open."* (E39)

Following the same principle of having enough space, the feeling of 'claustrophobia' was associated with buildings, where in a general sense the common comment was to dislike high rise buildings and high density, even in the Central City. This perception was enhanced by the earthquake, which was frequently acknowledged as a reason to avoid crowds because especially after the event they feel *"a little bit claustrophobic"* (E72). Many interviewees said they *"prefer to be outside, so [they] prefer Re:START mall and stuff like that, because you can be outside and still do your shopping"*.

> *"Just be more for safety too. Keep [the buildings] a bit lower and then you bright things up. We can make it a completely different city. We don't have to be like every other city and make everything about business and jam everything all into one bit, especially because where you work it's already jammed enough, let alone having everything else like that too. I think that's why people tend to move out of the city. They move into the suburban areas because there's more land, people are more relaxed."* (E47)

The earthquakes experience increased the perceived value of *"hav[ing] places to go and get away from buildings"* (E19). Some respondents said the city *"didn't have enough green (…) but it will look better, because they [the planners and urban designers] will use the river"* (E65). In this sense it was said that *"more open public spaces"* (E44) are needed, not just *"open spaces, but that has things [such as] good sitting, not necessarily linked to a café [but a place] that you can just go (…) and you can actually eat your lunch without seating on the edge of planters like this*" (E44). Before the earthquake, the river was seen as a good place for that purpose.

Lower density city and places for living

In contrast with higher density cities where living in apartments implies a reasonable distance from the outdoors, Christchurch lifestyle provides an *"instant access to the outdoors"* (E74) (A. Mitchell, 1972; Shillington, 2013). A natural consequence of having more space and houses that are isolated from neighbours is lower density. The building typologies in Christchurch, including the houses in the Central City are one door distant from the outdoors and this condition generates a greater connection between inside and outside. Accordingly interviewees highlighted the importance of this instant access to the outdoors:

> *"You've got to keep warm and it is hard to keep warm sometimes, so you spend more time indoors. I like a house that can open to the outdoors. (…) I used to work with a guy that sometimes timidly open the window, like a few inches… If it was me I'd open it more. I like the outdoors and the indoors/out, I like that kind of mixture."* (E51)

And some take advantage of the natural physical landscape:

> *"The way we built our house upon the hill, it's a two storey place and in each door there's a big deck and there's nothing better than, at this time of the year, go there and get some vitamin D, and sit there and have a cup of tea, read a book… Do something in the sun. It's very important for me to be out… Mind you I was born in a farm in Southland, so I was brought up in the open air and outside, riding horses."* (E40)

Christchurch people like to travel and visit other cities, but they are said to come back to Christchurch later in life, especially to raise a family in the city. In comparison with cities that offer all those other aspects of city life *"in terms of other things, like more access to certain types of entertainment (…) [and] things where you have urban microclimates and environments that are bustling and vibrant, more festivals etc"* (E79), some locals said not to like it because

> *"Just having too many people around made me feel really unsafe [in London]… In Christchurch you feel quite safe. Like the roads were awful, I'm glad I wasn't driving. And I didn't like how dense that was. I hope Christchurch doesn't turn out anything like that."* (E69).

Even when compared to larger and denser cities in New Zealand, the peaceful environment offered in Christchurch is a reason for choosing the city for living.

> *"Part of the reason why I'm going to the University in Christchurch is because there aren't a lot of people around. It's a small city, and that's why I'm not at the University in Auckland or Wellington. I hate really busy cities where it's always busy everywhere you go and you can't just have time to yourself."* (E25)

Regarding the aesthetics, keeping *"low rise buildings (…) timeless simplicity, rather than trying to recreate the historical look"* (E30) has also been pointed out. Although locals value the historical

buildings, most see the earthquake event as a *"chance for the city to reshape itself and find its own style"* and in this sense the *"open spaces are quite important… Open, medium places"* (E30). This openness is such a strong local characteristic that in some cases it is the very reasons for foreigners to choose Christchurch to live.

> *"I think this might be a bit shocking [for kiwis]. Change a feature that already exists in the city, and even in all the country, a bit less in Auckland and Wellington. But here Christchurch area is large for the amount of people who live here. I am very pleased with it, and that is why I chose to live here."* (E56)

Christchurch is indeed a dispersed city. Some initiatives to increase density have been put in place, but not many of them were well received by locals (Vallance et al., 2005). For some interviewees the low density dispersed city is seen as part of the local culture:

> *"This will be quite a hard cultural shift for many New Zealanders. (…) I think there is a culture in New Zealand of the aim, or the dream of many people, is to have a property. Not necessarily a big property, although certainly people with a bit of money will buy lifestyle blocks in the edge of the cities which has become the popular thing to do if you 'have made it'."* (E79)

Regarding the general city greenery Christchurch is considered "*good because there is always open space which has less building, especially when you are looking on the maps there is a lot green areas*" (E36). The idea of having more greenery was frequently associated with *"not [having] so many high buildings after what we've been through*, *[so we should have] more greenery in the city"* (E77). For that reason and associated with the wish of not having too many people in the same place, lower density was frequently highlighted as desirable and in some cases associated with safety because of earthquake associated risks.

"Want[ing] a way of escaping" (E31) was also extensively highlighted. The ideal was explained as *"com[ing] here [to the Central City] to people watch, rather than be talking to them. Rather just sit in a café with a friend and people watch than participate in that"* (E31). And you would not *"like to be in here [in the Central City] every day"* (E31), therefore it is nice to have another place to go, but not to live. A large number of respondents of this investigation live outside the inner city, closer to the beaches, hills or the rural outskirts. A frequent reason for choosing that lifestyle is accessibility, as in Christchurch it is possible to easily live outside of the city and in a short period of time be in the CBD. Respondents highlighted that they *"want it to be a city, but then go away from it"* (E43), so it is good to *"always have that option of going home and get away from the busy roads"* (E25). Because of this preference many locals like the idea of living outside the Central City, in the suburbs or even further away in small farms or lifestyle blocks. Lifestyle blocks are common in New Zealand and were described by an interviewee:

> *"It is pretty much a mini-farm really, so… Whereas the old suburban quarter-acre dream has become more like 6-1000 square metre dream for many people… People slightly older, being the more successful part of the middle class, often looking for getting out of the suburb as they become more packed and actually further out and having a couple of acres or something like that where they can have a bit more space and peace and quiet around them. Maybe get into some farming thing."* (E79)

And when asked if it is a *New Zealand* or a *Christchurch* characteristic they complemented *"it is probably a New Zealand thing, but maybe Christchurch a bit more than other cities"* (E79). Craig et al. (1993, p. 47) has suggested that this wish to live outside the city – in this case living in the hills instead – is part of a Christchurch's identity of being connected to the physical landscapes:

> It is not only the beauty of the views that attracts buyers, but also the fact that they can identify themselves with these features. In other words, there is a certain pride residents feel in having these views and they are prepared to pay for this which in turn becomes part of their identity.

The choice for places to live keeps alive the connection with natural environments and with the local outdoor culture. This choice for the peacefulness found in nature is brought to the city where locals look for ways of being in and out of the social environment, and escaping to their homes in quieter environments. Lower densities which provide quieter environments and living with more space are highly valued, as this is seen as the good local lifestyle.

A particular characteristic of the local culture that shapes the urban landscape can be found in the feature of New Zealand history of settlement known as the *quarter-acre section*, or the *quarter-acre pavlova paradise* as referred to by Mitchell (1972, 2002). The 'New World' brought the possibility of a lifestyle that had been lost in England (Christchurch City Libraries, 2013; McBride, 1999; A. Mitchell, 1972) and therefore not having to *"live in your apartment, but [to] live in your small house or flat and then you have your small garden around you as well"* (E32). Moreover *"people's desire to have a backyard may be an expression of hav[ing] that instant access to the outdoors and that may be a particular Christchurch thing"* (E74). This characteristic of the local lifestyle is seen as *"a Kiwi thing, that comes from way back from the settlers and we always had big gardens"* (E27). The idea that *"we never had little gardens, we always had standalone houses in a big garden"* (E27) is part of the memory of many of the respondents. The quarter-acre section is still present on the local lifestyle as part of the regional identity. It helped shape the suburban areas and it is still the preferred way of living as locals dislike the idea of living in small apartments without a backyard.

> *"It comes from a mixture of things. I think it's partly our longing for a bit of peace and quiet that people like. Going to visit places that are fast and furious and vibrant, but they not necessarily want to live in it. (…) It might also be a deeper thing of the pioneer in New Zealand, of people that came out here often were from that lower middle class in Britain and they wanted their way of being able to afford it."* (E79)

The local lifestyle becomes even more evident through the eyes of foreigners who decided to make Christchurch their home. In this sense, the contribution of foreigners – who are living in Christchurch for at least three years – is valuable to understand the nuances of the local culture that are understood as the "*norm"* (E76) or the "*right way"* (E69) of living by locals. In some cases the local peaceful context, the possibility of being in contact with natural environments and the opportunity to participate in outdoor sports was the main attraction on deciding to make New Zealand their home.

> *"I first lived in Vienna and it's quite a liveable city, but you tend to live in apartment buildings (…) so you don't have your garden around you. And that's something that I'd sort of prefer in living here. (…) You live in your small house or flat and then you have your small garden around you as well. I quite enjoy having that. That's probably a little bit more obvious, but if you have the garden you have the opportunity to sit outside, but (…) in Vienna if you live in an apartment you need to sit inside anyway."* (E32)

The appreciation for the outdoors attributes value to the public open spaces in the city and makes locals care and look after their natural landscapes. But it also defines some expectations towards the urban environment especially regarding the so-called local relaxed atmosphere:

> *"Ironically, because there's never quite enough people in one go in Christchurch that want that vibrant thing (…), most of people who tend to complain about Christchurch because of the fact it doesn't have that, most of them tend to leave and go to other cities. So the people that remain are people who are quite happy in that sort of environment. And that's partly what creates the [local] culture."* (E79)

In summary, in Christchurch the wish to live in contact with nature adds an important requirement to the city life, and then the urban environment is expected to offer privacy, space, (very) close nature, relaxed atmosphere and so on. Urban form that can provide all these desired qualities usually also require long distances to be travelled, and these long distances are conflicting with the idea of sustainable urbanism. Higher density is frequently acknowledged as a sustainable urban design solution (Neuman, 2005; Steemers, 2003b) – as it saves distances and enhances social and economic sustainability – but the value of space is still a strong characteristic of Christchurch city living and part of the local identity. In this sense higher density is not seen as desirable, as locals like to have their backyards and gardens as the immediate contact with the outdoors, and this had a significant influence on expectations about the quality of urban life.

2.2. Recreating the Central City life

One of the most dramatic effects of the earthquakes was the virtual destruction of the Central City as a place to work, shop and visit, and much of the effort of both government and private developers is currently focused upon rebuilding and reinvigorating the CBD. However the success of the Central

City depends on increasing the number of people and businesses attracted back in the area, and therefore it has to provide qualities and spaces that enhance and respond to the local identity and expectations. This emerged as a point of tension in thinking about urban comfort.

The Central City is the heart of Christchurch (McBride, 1999; J. Wilson, 2005), a place to work and socialise. The choice for being in the Central City was in many cases described as a matter of *"convenience more than really liking and choosing the area"* (E34) because *"it's in the middle of town here"* (E13) and a place to *"meet people"* (E37). The Cathedral Square was described as *"a convenient place where you can meet someone and everything (…) was around [t]here"* (E34). Because of its importance as a place that *"when you think of Christchurch you think about the Cathedral and this area"* (E34), although *"lots of Christchurch people are actually quite open to different things, the central part is going to be controversial*" (E79).

The perception that the *"key concept must be the gardens"* (E23) was widely discussed by respondents, but in some cases, especially regarding the Central City, it was connected to the idea that *"the heritage buildings are all demolished, there's no heritage here anymore"* (E23). The heritage is seen as part of the Garden City image (McBride, 1999; Rice et al., 1999). Christchurch is *"different from other places [and people] are proud of it"* (E65). Other places *"are very beautiful, but you get to hours that it's just so crowded"* and the *"old buildings and old doors combined with that laid back lifestyle in New Zealand. I just think this is different"* (E65).

Despite most respondents preference for living out of the Central City, some highlighted that they *"absolutely loved living in this area, easy access to all that green spaces, the bush, and all the cultural things are here"* (E33). But the situation after the earthquake has changed this perception. Now it is necessary *"to keep areas that people can just enjoy coming back into the city, and not just being all just full of buildings"* (E28). Although the loss of heritage was sad, *"we need to make the most of it and make our city more inviting for a lot of overseas people and for the locals too (…) because with all these issues of the earthquake it's just too much for them to be in the city again"* (E28).

> *"I really enjoyed going [to the Central City] because you'd meet with your friends and you had things to do. You can find everything you need there, and you spend hours walking around town and stop in cafés and have things to eat…"* (E47)

But although the Central City was a very popular place for visiting and socialising before the earthquakes it was not a very popular place to live. Only around 8,000 people lived in the area (Christchurch City Council, 2011b, see also Chapter Four). The reasons for that are the higher density and the impression that it is a noisy place. In the rebuilding plan the City Council now expects around 20,000 people living in the area (O'Callaghan, 2013). However, Vallance, Perkins and Moore (2005), in research about urban infill in Christchurch, identified two variables as most important for

Christchurch people: trees and greenery. Their work is focused on housing and therefore largely based upon the suburbs instead of the Central City, but it shows the values and what locals look for when choosing places. The authors explain that the residents saw this loss of greenery and open space as extremely ironic given the Council's environmental justification for intensification (that is to reduce the urban carbon footprint and other environmental effects). This highlights the tension between increasing density to make the city more sustainable regarding distances travelled and the concept of a Garden City.

Vallance et al. (2005) also found out that higher density implies *sharing* things with strangers, and that is not seen by Christchurch people as a desirable thing, and pointed out that it is important to consider what is ideal in certain areas of the city from a cultural and historical perspective. In this context noise and pollution were the main reasons for the resistance to adopting a denser city form and lifestyle. Their findings are aligned with the perspective that there is a cultural meaning and importance of having space around the house and being able to *escape* from the busy life. My own findings are consistent with this, as interviewees made clear that they do not like 'sharing' and for that matter do not like the idea of living in the Central City.

> *"You wouldn't get me sharing (…). I don't like the idea of high density, you have to have spaces between houses, you have to have grass between houses, or some sort of bush (…). But in terms of sustainability, yes, there is a problem. But I think if we had a sort of transport mechanism (…) like electric buses, I think that would work better. I just don't think it would be a nice city to be in if it was apartment and high density and enclosed."* (E31)

The sense that the Central City gives a lot of the image of the Garden City to Christchurch, but *"if you live here you can't really have space for [gardens], so you don't have a chance of being yourself part of the Garden City"* (E35) was frequently discussed. Because the city is spread out and has lower density, everyone can have a garden and it is seen as part of being in Christchurch. Therefore the Central City, where you have less space and more apartment style living, does not sound an interesting place. On the other hand, the characteristics emphasized as desirable reflect the Garden City ideal.

If the physical landscape influences the way locals socialise and their preferences for urban environments, as a consequence there is also a special meaning associated with urbanity. This relationship of *who we are*, what is the environment we like and how we socialise is closely related to the desired type of urbanity dictated by cultural factors (Tittle, 2001), frequently neglected in urban sociology. Urban sociology generally approaches urbanity based upon generic ideas of liveliness and street-life, often stressing that activity is central for urbanity (Kloosterman & Trip, 2011; Montgomery, 1998) and that social spaces are the answer for a good urban space (Gehl, 2009,

2010; Whyte, 2001). However urbanity has varied meanings, as discussed in Chapter Two and the idea of a vibrant city has to be observed based upon the local concepts of liveability and what is expected from the life in the central city and in the city as a whole. The aim of preserving personal space, having fewer people around and avoiding crowds influences the image of the ideal city. This idea of the desired urban life also influences the local concept of liveability. Urban comfort and liveability in Christchurch is influenced by the physical landscape and collective memory derived from the local outdoor culture, and the inner city life was frequently regarded as an interesting place to be, meet friends and spend social time, but not a place to live.

This finding highlights a need to understand what makes an interesting urban environment in terms of local cultural values and principles. Interviewees who have travelled to foreign countries described the best features of Christchurch as being *"more environmental and focused landscape"* (E79), meaning that European countries, for example, have their most attractive landscapes as urban environments. But Christchurch is now in a fortunate position to enhance its value as the Garden City, and at the same time provide nice urban environments around the Central City – such as the Arts Centre, as highlighted by many interviewees as a favourite place – this way Christchurch can *"have the best of both worlds"* (E79).

The Central City is, therefore, a point of tension in the rebuild. While higher density promotes better economic results and sustainability there is a local desire for space, peacefulness and greenery. There is also a need for people to live in the area, so its economic potential is enhanced, but locals resist living in places with higher levels of urbanity intrinsic to urban centres. These characteristics of local lifestyle and living raise the question of how to promote urban liveability and economic sustainability in cities where locals want to enjoy vibrant urban environments, but not live in an intensely urban setting.

3. SUMMARY

Aspects of Christchurch's culture that influence the local concept of urban comfort are related to its physical landscape (geographical location, outdoor values, and recreational and gardening activities) and to the social landscape (Garden City as a way of living and the Central City life).

In the local context, the concept of liveability is closely related to the presence of nature, for work, social life, daily physical activities and family time. Nature assumes a strong meaning in the collective culture of people from Christchurch and the peaceful environments found in the outdoors are, to a certain extent, also expected within the city. Besides the relaxed atmosphere there is the ideal level social activity. The local climate, especially in the South Island can be very cold and locals learn how to deal with it and what to expect. But it has been highlighted by participants that their attitude

towards climate is also affected by having company or not, as the perception of having people in the place reduces the effect of unpleasant weather.

The combination between the desired qualities of urban space (regarding greenery, density and aesthetics), the ideal social settings (peacefulness, personal space and vibrancy), and the possibility of using public open spaces in the city provide the elements that constitute the local idea of urban liveability. The climate experience (the general local climate and the microclimates around the city) allows or hinders the use of public open spaces, therefore the importance of providing reasons for climate adaptation is an important aspect of local liveability.

CHAPTER EIGHT: Discussion and Conclusions

1. REVIEW OF OBJECTIVES AND APPROACH

The focus of this thesis has been upon the complex relationships between local culture, microclimate and urban comfort viewed through the perspective of collective and individual adaptation. Assessment of urban liveability has conventionally been based upon measures of people, activity, and business success, but in this research I provide evidence that the subtle, but extremely important variable of *urban comfort* is equally important in promoting the use of urban open spaces throughout the year (Tavares et al., 2013b). The *urban comfort* concept highlights that urban liveability should be understood from a holistic perspective, integrating human comfort in urban landscapes and the role of regional identity in shaping climate experience, adaptation, and urban living preferences. Thus, this research adds a socio-cultural perspective to the discussion of climate adaptation based upon individuals and numerical measurements previously discussed in the literature (de Dear et al., 1997; Nikolopoulou & Steemers, 2003; Walton et al., 2007).

The context of my research, Christchurch, has a highly variable and frequently unpredictable climate, and consequently improvement of urban comfort in public open spaces is very dependent on microclimatic design and adaptive strategies. Based upon this understanding, I developed four main questions: (1) what are the characteristics of urban comfort in Christchurch?; (2) how is urban comfort shaped through local culture in Christchurch?; (3) what individual and social strategies people use to adapt to a highly variable (micro)climate?; and (4) how can an integrative methodological approach help explore urban comfort?

These questions have been investigated through an innovative theoretical approach to human comfort in urban landscapes. It represented a move from the physiological approach adopted to understand human thermal comfort, which is generally based upon building science conventions applied to outdoor spaces (Auliciems, 1981; Chernev, Targino, Coraiola, & Krecl, 2012; Givoni et al., 2003; Höppe, 1999; Spagnolo & de Dear, 2003). Instead, I adopted a socio-cultural approach – as applied in a variety of disciplines and fields of study such as cultural geography, anthropology, sociology, and urban studies (Cosgrove, 1984; Falzon, 2009; Gustafson, 2001; Janković & Barboza, 2009; Knez, 2012; Roncoli, 2006; Thornes, 2005). Rather than viewing the comfort of users of public open spaces as a static and clearly defined phenomenon with measurable attributes, I focused on the adaptive nature of the concept and the geographic and socio-cultural influences acting on its construction.

The applied methodology was also innovative and based upon a series of embedded case study sites (Yin, 2003) within Christchurch. I explored the post-earthquake condition of the sites – established emerging urban settings – and different urban forms and their resulting microclimate. Each case study site was explored through ethnographic methods (participant observation and in-depth interviews with users of these urban spaces), and microclimate measurements. The investigation of small units makes feasible the understanding of local needs through a bottom-up approach (Smit & Wandel, 2006). The next section of this chapter synthesises and discusses the research findings and highlights the implications of this research for theory, methodology and practice.

Table 7 introduces the subsequent sections of this chapter discussed next. It deals with three main things: the key findings of this research, the significance of these findings and its implications of this research for theory, methodology and practice.

Key findings – Urban comfort in Christchurch			
How we live	Garden City way of living		
Who we are	Outdoor values and education Gardening activities Connections between city and country		
How we adapt	Individually	What we wear Checking the forecast	Anticipatory
		Layering clothes Choosing places to sit	Reactive
	Collectively	Social interaction Choice for places because of social character	
Significance of findings			
Urban culture and adaptive capacity	Different cultures adapt in different ways to the climate Cultural values influence places people look for in the city		
Types and location of urban spaces and microclimate	Need for both social and retreat spaces Importance of microclimate in different settings Locating social and retreat spaces according to microclimate		
Levels of urbanity	How much is too much?		
Affording microclimate experience	Possibility of perceiving benign microclimate		
Implications			
Theory	People adapt if they find reasons to so – *reasons* are determined by culture Types of spaces and who they attract – age, activity and lifestyle		
Methodology	Interpretive Integrative Adaptive		
Practice	Providing different levels of urbanity through design Perceiving microclimate Placing activities according to microclimate		

Table 7: Summary of findings and implications

2. KEY FINDINGS – URBAN COMFORT IN CHRISTCHURCH

The underlying proposition of this research, is expressed in the diagram (Figure 51) is based upon Shove's (2003) concept that comfort is culturally achieved and not purely physiologically defined. It stresses the idea that human comfort in urban landscapes can only be thoroughly understood through an investigation of the relationships between liveability, local culture, and adaptive strategies.

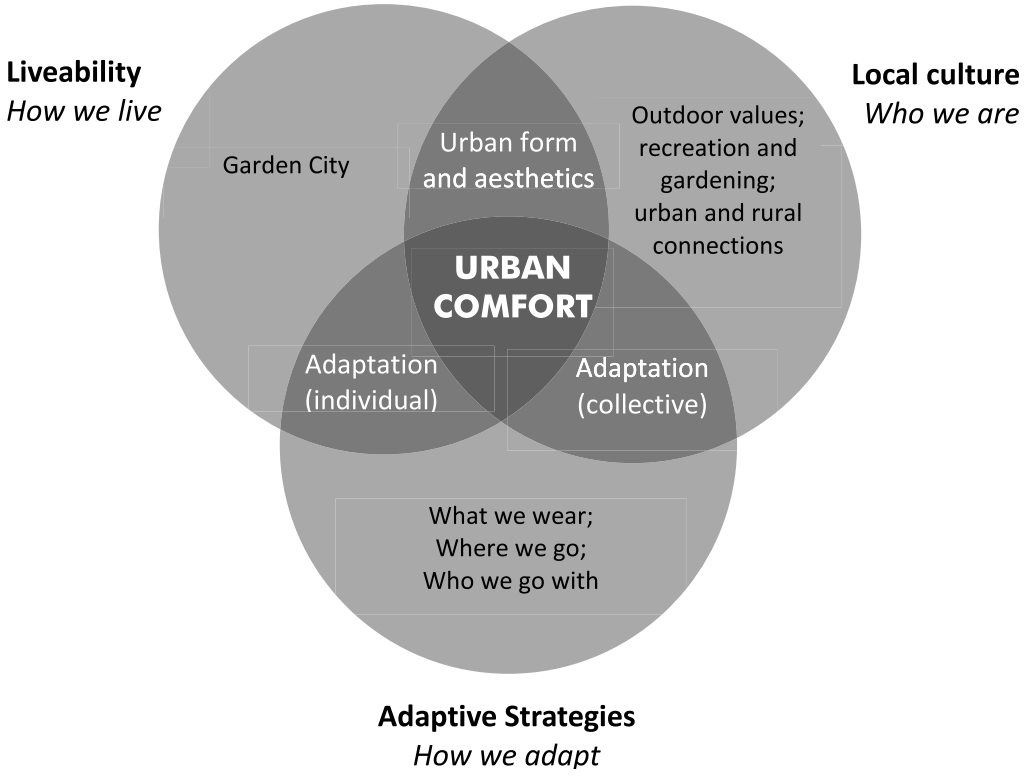


Figure 51: Christchurch urban comfort

In summary, urban comfort in Christchurch is influenced by *how we live* – the level of urbanity expressed in the Garden City way of living, with a need for both meeting people and the possibility of escaping from crowds, and the need for green spaces (public and private); *who we are* – the regional identity, which draws on both the physical landscape and the activities we undertake in that landscape*;* and *how we adapt* – the preferred microclimate and adaptive strategies (regarding both individual and collective strategies). The three main factors shaping *urban comfort* in Christchurch are synthesised in this section followed by a discussion about individual elements and how they influence the adaptation process.

2.1. How we live

In this research the case study frame was based upon two main variables: post-earthquake condition (established and emerging urban settings) and urban form (building-defined and landscape-defined

street form). The fieldwork analysis identified the case study sites as demonstrating two different types of urbanity. Two sites were identified as *urban social spaces* – the ones that have their main activity based upon social interaction – and two were identified as *urban retreat spaces* – which have their main activity based upon people alone or in small groups seeking peaceful environments instead of social interaction.

In Christchurch the preference for sites with these types of urbanity was demonstrated through a belief that town and country are and should be closely connected, and that the social environment should be integrated with its natural surroundings (B. Clark, 2003; Howard & Osborn, 1965). Evidence has shown the type of public open space the majority of Christchurch people want is based upon a Garden City way of living. It also suggested that choice of places to live is influenced by the local identity and is translated into housing that allows instant access to the outdoors, especially through private backyards. Urban solutions to accommodate the Garden City ideal, including peacefulness, escaping, and space, influence the resulting urban form and generate lower density.

Respondents' accounts also expressed a desire that the post-earthquake city should be redeveloped with extensive green spaces and lower density. The Garden City way of living has been an important feature of Christchurch for over 100 years (see Chapter Four) and proved to influence the concept of what is a liveable city, identified through certain types of public open spaces and the choices people make for where they spend time in the city. This showed that the character of the urban settings – social or retreat – is an important variable, and while some people search for vibrant social spaces, many people in Christchurch seek spaces with a peaceful green character. Urban liveability in Christchurch therefore implies a lower level of urbanity compared to the metropolitan centres upon which much urban design literature is focused.

Most significantly, these findings suggest that the quality of urban spaces influences people's adaptation to the climate. If for any reason people want to be in a social place they will find ways of adapting to the microclimate. On the other hand, if they seek a *retreat*; space they are more sensitive to environmental conditions – including microclimate. The qualities of the urban environment therefore have a role in extending adaptive capacity.

2.2. Who we are

Regional identity is the collective expression of the way people live in their environment, and it is closely influenced by the way communities adapt to the environment and change it to suit their needs (Hough, 1990; Paasi, 2003, 2012). The way we see things is shaped by our background and the experiences we have had (Triandis, 1994), and these experiences are made possible as a consequence of the affordances of places (Gibson, 1986; Norman, 1999) shaping how we see and use

the world. In Christchurch the physical landscapes in and around the city afford certain types of outdoor activities which influence the local identity and consequently the expectations toward urban environments. The idea of *who we are* is therefore strongly related to the city's geographical location and its physical landscape. I identified three main factors shaping Christchurch people's identity: outdoor values and recreation; gardening activities; and the connections between city and country.

Christchurch residents expressed a lot of pride in the reputation and identity of being outdoor people. The location between the Southern Alps and the sea means that activities such as tramping, climbing, surfing, kayaking and so forth are just a few kilometres away. Through engaging in these activities, local residents get in touch with some of the best known features of New Zealand: beautiful and largely natural landscapes.

Besides traditional outdoor recreation, other activities such as gardening or activities related to rural living are also present in the idea of *who we are* and why *we do what we do*. Gardening promoted by organisations such as the Christchurch Beautifying Association and Horticultural Society and expressed through garden clubs and competitions (J. Wilson, 2005), makes home gardeners direct contributors to the city's identity, increasing the desire of many residents to have gardens at home. Additionally, the connection between urban and rural settings adds to this strong sense of outdoor living and to the local identity of New Zealanders as *tough people*, helping generate a particular expectation regarding the urban environment and response to the weather and climate.

These three key characteristics of the local identity also influence locals' adaptive capacity. First, the sense of being outdoors people make locals want to adapt to the climate so they can engage in the favourite outdoor activities for longer periods throughout the year. Second, the role of the gardening and the historic connections between city and country increases the awareness of seasonality and defines meanings such as change of seasons and expected behavioural response.

In summary, in Christchurch the local culture is highly influenced by the local physical landscapes and its seasonal climate. The values found in nature influence people's relationships between themselves and with the urban environment. In my research, most interviewees described their preferred choice for public open space based upon an adequate amount of greenery, low levels of traffic, presence of people (but no crowds), and a variety of spaces to offer both relaxation and vibrancy for different age groups and lifestyles. Together, these values related to the physical landscapes define the local identity which influences the meaning of urban comfort.

2.3. How we adapt

Climate shapes the life of Christchurch residents in many ways, and adaptation happens both in anticipatory and reactive ways. Adaptation is translated into actions such as checking the forecast,

choosing what to wear, choosing places to visit in the city, and identifying ideal seasons to be in the outdoors. In spite of that, Christchurch climate is generally seen by locals as mild, and one that does not hinder the use of open spaces, although it influences the frequency of activities.

Christchurch has a unique and highly variable maritime climate, where the thermal sensation and urban comfort are directly related to the wind patterns and availability of sunlight, and where the temperature is rarely too hot, as reported by interviewees. Nonetheless, the data gathered in this study shows that discomfort caused by the heat is seen as more unpleasant than that caused by cold (Tavares et al., 2013b). Locals tend to find easier to adapt to the cold due to the clothing technology available, especially for clothes designed for outdoor activities.

I found that in outdoor settings people adapt their behaviour to achieve thermal comfort which is consistent with Nikolopoulou and Steemers (2003). But I also found that in Christchurch urban comfort depends on adapting to the climate both at the individual level and at the collective levels. On the individual level, adaptation happens because locals know the seasons very well and understand how unpredictable the weather can be throughout the day. The process of adaptation can be anticipatory (choosing what to wear, checking the forecast, and possible changes that might happen during the day) or reactive (putting or taking off clothing layers according to the temperature variation, choosing where to sit and so forth). On the collective level adaptation is largely reactive, and it happens both because of social interaction and through choices of places to be in the city according to their microclimate and social character. In this regard, I investigated urban spaces with varied design, revealing that design solutions have a significant impact on the resulting microclimate. Christchurch people often scan for places where it is possible to enjoy the warmth from the sun and shelter from the wind, which suggests that sensitive microclimate design could be the key to many successful streets and businesses.

The social function and character of urban spaces generates different adaptive practices. In urban social spaces, social aspects such as vibrancy and activity dynamics are more important than the microclimate itself. In these cases, the reasons to be in place are varied, and include the street activity and the presence of people, adding to people's adaptive capacity. The situation is different in urban retreat spaces where the microclimate is one of – if not the most – important variable to influence people to use public open spaces. In other words, in urban retreat spaces the reason to be in place is the place itself, with all its qualities including microclimate.

Although social areas are very important and well used, in many cases public open spaces need to provide just enough vibrancy, and not all spaces around the city have to aim for the same vibrant outcome. In this sense, urban retreat spaces are fundamental as they are seen as ideal spaces for work breaks in busy work days and for individual visitors depending on their lifestyle and age group,

but in these spaces the microclimate has to be more controlled than in urban social spaces. Respecting and providing the desired levels of urbanity and both social and retreat spaces is essential for stimulating adaptation, and this suggests that If taken into the process of designing urban landscapes, the concept of urban comfort can be a powerful tool to enhance adaptive capacity and liveability, extending the use of open public spaces throughout the year.

3. SIGNIFICANCE OF FINDINGS

Urban researchers have called for further investigation of the micro-geography of urban space, specifically how space qualities and features (including microclimate) structure human experience (Stevens, 2007). My research responds to this call through the exploration of the concept of urban comfort. Drawing upon and extending the work of Shove (2003) I have argued that the meaning of comfort is constructed collectively through social interaction in particular places and regions, drawing together the socio-cultural dimensions of urban environments and thermal comfort experience.

My results suggest that urban culture has an effect on adaptive capacity, which is reflected in the types of public open spaces, levels of urbanity and space characteristics, and the microclimate experience they provide. Although tested in the specific context of Christchurch, these key findings are applicable to a wider range of urban settings and are discussed next.

3.1 Urban culture and adaptive capacity

This work has challenged thermal comfort studies that understand human comfort resulting from the building sciences, and which have been mainly developed in controlled indoors environments. More recently developed adaptive models of thermal comfort have been based upon the belief that people adapt to be able to enjoy the urban spaces if they find reasons to do so (Auliciems, 1981, 2009; de Dear et al., 1997; Nikolopoulou & Steemers, 2003). The limitation of this research, however, lies on the fact that these models are frequently based upon an individual perspective and often do not consider the role of collective regional identity and culture on comfort.

Climate-related work conducted in the area of cultural geography and other areas has also pointed out that a purely physical approach to climate is insufficient as that climate experience is dependent on one's memory, behaviour and identity (Hulme, 2008; Westerberg et al., 2003). However, as Fresque-Baxter and Armitage (2012) have previously pointed out, a collective approach has to focus on collective dimensions of place identity, and how it influences people's collective response to climate related issues. The results of this research have also shown that an individual perspective is insufficient to understand why people respond to the microclimate in certain ways. I have then

added a collective cultural perspective based upon the specificities of Christchurch urban life. In this sense local urban culture influences adaptive capacity, because when spaces are planned according to local expectations, they can potentially extend the thermal thresholds corresponding to human comfort.

In Christchurch interviewees largely described their cultural values of the outdoors as being intertwined with urban values affecting how they experience and respond to the thermal environment. This finding is consistent with Thorsson & Knez (2008) who compared the thermal, emotional and perceptual evaluation of a park from Swedish and Japanese perspectives, concluding that these cultures "might have evolved cultural-related subjective scales accounting for the different assessments of thermal comfort" (p. 1489). In the case of Christchurch therefore, two main types of spaces were identified, highlighting that locals attach their choices for vibrant or peaceful urban spaces according to their identity and local culture.

3.2. Types and location of urban settings and microclimate

Culture has an impact on people's preference for place qualities – influencing the experience of the thermal environment (Knez, 2003a, 2005) and also influences the types of spaces people look for in urban environments. This was demonstrated by the character of the case study sites, where at times interviewees highlighted presence of people and friends as reasons to be in place, and at other times the quiet atmosphere was regarded as important. This distinction helped classify the cases into *social spaces* and *retreat spaces*.

Besides the importance of social character, this classification was also fundamental in regards to understanding the importance of microclimate design in different types of settings, and in understanding what type of design interventions and the resulting social activities could make a street with poor microclimatic more successful. The example of Christchurch demonstrated a distinction between the character of different types of social situation, demonstrating that urban microclimate and thermal comfort are fundamental in urban retreat spaces where the attraction is the place itself, and less important in urban social spaces where social interaction is the main attraction. These findings raise questions about work related to microclimate conducted in urban studies where field work was largely carried out on 'good days' and in social spaces, (e.g. Gehl & Svarre, 2013; Whyte, 2001). It raises the questions of whether these previous studies show *all* relevant aspects of place identity, how different groups might be accommodated and react to microclimatic conditions in the city, what alternatives are possible for existing built spaces with poor microclimate?

A key to this problem could be to place different types of activities in different types of microclimatic context, suggesting that a way of bringing life to places with poor microclimate is to foster social activity. While urban social spaces also benefited from good microclimates – and in some cases might only be successful under this condition – taking action to improve the social character of urban spaces can be a good way of enhancing activity in streets lacking sun. For example, it may be that active building frontages are most critical in streets with poor microclimate.

Another inconsistency found in relation to urban studies relates to the idea of streets as spaces of movement and squares as places for staying, as suggested by Gehl and Svarre (2013). The disturbed character of the post-earthquake urban environment in Christchurch at the time of this research meant that this distinction was lost. Gehl and Svarre (2013) compared walking speeds in these types of settings, concluding that "pedestrians reduce their speed when moving from a street space to a square (…). [And that t]hey slowed down despite the relatively cold weather in which the studies were conducted – about 5^{o}C on grey winter days, not exactly typical promenading weather" (p. 113). In Christchurch, however, locals were making the most to support and be part of the post-earthquake transitional city they had at the time of this research. In this context – and possibly in many others – streets with social activity can become places for *staying* as demonstrated by Cashel Mall and Rotherham Street.

3.3. The concept of liveability and levels of urbanity

Urbanisation is a major driver of environmental and social change, and the need for improved global sustainability requires cities to become more sustainable (United Nations, 2015). This in turn implies a need for more compact and walkable cities, minimizing the use of cars, and maximising businesses success for economic growth. These principles are all reflected on the idea of liveability and urbanity, but understanding these concepts purely based upon density and vibrancy can be misleading.

In recent years, liveability has become a common term to rate cities through indices such as Mercer's Quality of Living Ranking (Mercer LLC, 2015), the Economist Intelligence Unit's ranking (The Economist Group, 2015) and Monocle's Top 25 Most Liveable Cities (Monocle, 2015). These and other rankings feature a variation of cities in first and subsequent places, and frequently use terms such as *liveability*, *quality of life* and *quality of living* interchangeably. This feeds the debate regarding concepts of liveability and prompts the question: Does liveability have the same meaning in New Zealand, Denmark, Brazil and China?

Jan Gehl (The City Fix, 2015) for instance, has recently affirmed that "man [i]s universal: we are built the same way—we have the same senses, so solutions can be universal. What is good quality in Copenhagen is also good quality in India". However, urban designers have to be aware of the

uniqueness of places, and that although our physical capabilities are built the same way, our cultures are not. They are formed and operate differently. In the same way, preference for urbanity levels is influenced by past experiences and the context we live in. The desire for vibrant and diverse characteristics of cities that define urbanity (Castello, 2010; Lévy, 1997) are connected to particular values, attached to background and ways of living. But urbanity does not necessarily respond to the way specific cultures have evolved or have chosen to live. Fischer (1984) has argued that collective activities – which are related to local cultures – in urban spaces help form much of the urban experience for residents. The social setting is therefore fundamental to understand the nature of urban experience and concepts of liveability and urbanity.

The interpretive approach adopted in this study considered people's urban *experience*, and consequent *adaptation* to urban spaces from a *collective* perspective, emphasising the importance to consider liveability and urbanity in context. The choices Christchurch people make regarding different space characters is evidence that social interaction is not always the most valued feature of public open spaces. Locals like to still be able to find peaceful spaces in the city, and there is a need for lower density and peaceful environments found in nature. The local outdoor culture and the lifestyle that values private backyards and large amounts of open spaces and greenery within the city may not be compatible with high levels of density. Research in Christchurch therefore raises the question of how much urbanity is too much? It also suggests that it is important to find ways of keeping the required levels of urbanity and types of spaces, while promoting more compact, economic and sustainable cities.

3.4. Affording microclimate experience

Affordances are actionable properties of spaces (Gibson, 1986; Norman, 1999), in this sense an improved microclimate would afford meetings and lingering opportunities for people in public open spaces. However, the interpretive nature of this study has shown that in some cases it is insufficient to have an amended microclimate if people do not have an opportunity of realising that using the open space is a possibility. Evidence of this situation was identified at the Windmill Centre where, due to its successful microclimate design, it was in some situations 10^{o}C warmer than the general temperature measured in Christchurch, but during large periods of time the space was still empty. Most clients of the café would leave their cars and walk into the establishment assuming that, because it is winter, it would be cold outside.

This finding supports the idea of *interaction aesthetics* developed by Xenakis and Arnellos (2013). Interaction aesthetics is a factor allowing users to detect possibilities of action, consequently detecting affordances. This emphasises that urban planning and design have to be strategic and not only produce benign microclimate, but provide people with the possibility of perceiving the improved

spaces, rather than automatically making the decision of being indoors because of preconceived ideas regarding the weather – it is winter, therefore it is cold.

This feature of public spaces is particularly important in places with highly variable climate – as Christchurch – where it is not unusual to have warm days during the winter and cool days during the summer. Moreover, wind and sun are the two main variables for designing with microclimate. And in Christchurch specifically, as the weather patterns are highly dependent on wind patterns (both intensity and direction) and sun availability, enhancing the microclimate variability between courtyards/protected places and open spaces is fundamental.

4. RESEARCH IMPLICATIONS

This research was exploratory and aimed at making sense of the complex phenomena of urban comfort. It was intended to be a critical reflection and a collective alternative to the existing individualistic perspectives on the topic and has addressed a need for a broader understanding of how collective identity and values shape how we use the urban environment and enable adaptation to adverse microclimate. While based in post-earthquake Christchurch, the key findings have wider relevance for theory, methodology and practice in the urban landscape design field. These implications are discussed next.

4.1. Theoretical implications

A key theoretical implication of this research regards the relationship between urban culture and adaptive capacity. The way people experience the city can be improved through urban design that provides the desired qualities according to the local culture. People adapt if they want to do so, if they find reasons. Therefore urban spaces should be planned to respond to the characteristics of local cultures and their identity. Adaptation to the climate responds to the desire of individuals to enjoy the urban environment. Adaptive capacity can extend the time spent outside, but it has to be investigated from a multi-disciplinary approach.

This research confirmed Knez and Thorsson's (2008) theory that culture, memories and past experiences have an impact on climate experience. For this reason, although comfort does depend on physiology, the meanings of comfort and cultural identity influence how people experience the thermal environment. An analysis of microclimate design based only on numerical measures is therefore insufficient.

Numbers are therefore important but social life and cultural values also influence climate perception and adaption. By taking account of the historical and social contexts within which urban comfort meanings are developed, this study has located human comfort in an integrative framework, adding

the socio-cultural aspects – intrinsic to the urban life – to scientific knowledge. Furthermore, it has expanded the scope of existing human comfort research and has built on the small number of socio-cultural studies on the topic.

Another fundamental theoretical implication regards the types of spaces within the city, the people they attract, and the need to consider them as fundamental parts of city living. People with different lifestyles, age groups and searching for a different type of experience in the city might choose peaceful spaces or places based upon social interaction. This highlighted that preferences for places are also related to age groups and lifestyles. However the question of why retreat spaces are preferred by older generations remains unresolved. Is it because that was what they were used to growing up (collectively) or because psychologically and physiologically (individually) they feel more comfortable?

4.2. Methodological implications

The thesis provided three main methodological contributions: the use of interpretive research in the urban microclimate and thermal comfort fields; an integrative approach to explore the relationship between people's description of climate experience and the real microclimate measured at the site; and an adaptive field strategy in response to rapidly changing environments.

The first methodological contribution regards the use of an interpretive strategy and how I added a new dimension to the understanding and approach to human comfort in urban environments. I have shown that there are more variables involved in the equation than mere physiology. As highlighted by Nikolopoulou and Steemers (2003) adaptation is dependent on many factors – physical, physiological and psychological – but as pointed out by Knez and Thorsson (2008) it also depends on socio-cultural factors. The adoption of an interpretive methodology that includes *climate ethnography* (Magistro & Roncoli, 2001) has allowed the investigation of *how* cultural factors can be investigated and meanings related to climate can be understood. Most previous work on outdoor comfort has used quantitative analysis to conclude that there was a cultural variation, but has not explored how this variation happens or what causes it. This work has shown the importance of interpretive strategies in investigating comfort of users' of public open spaces, making sense of *why* things are as they are.

In this regard, important interpretive work on urban design has been done by Gehl (2010), Gehl and Svarre (2013) and Whyte (2001), who have adopted methodologies largely based upon observations. Gehl and Svarre, for instance, claim that direct observation help to understand *why* some spaces are used and others are not. Nevertheless, while my work has supported the idea that observation is fundamental to understand the dynamics of spaces – as it helps to understand *how* spaces are used

and *what* areas are more popular – observations are insufficient to comprehend the uniqueness of culture and place, and indeed *why* people choose certain places, levels of urbanity and what are the thresholds of their adaptive capacity. Therefore, in the case of microclimate, adaptive capacity and choices for places, an interpretive approach based upon in-depth interviews was necessary to explore the dimensions of local culture and microclimate.

An interpretive strategy alone, however, would not provide insights regarding the substantive physical nature of urban comfort. A link between the participants' description of their climate experience and the real microclimate at the time of the interview was needed. Were they saying that 5°C or 25°C was comfortable? In response to this problem, the second methodological contribution is an integrative methodology combining an interpretive strategy and microclimate measurements which allowed for comparison.

The third methodological contribution highlights the importance of a flexible research strategy to be applied in highly dynamic urban environments, such as those found in post-disaster situations. The unstable post-disaster context added an extra layer of complexity, meaning the study is less controlled and definitive, but on the other hand, it allowed urban comfort to be tested from a broader perspective and influenced by a number of unexpected variables. Besides highlighting the challenges of working in a constantly changing and unpredictable landscape, the interpretive strategy has allowed the investigation of *how* rapidly changing environments influence adaptive capacity. This methodology is valuable to understand people's experience of – and adaptation to – very dynamic landscapes, and it can be applied in research related to a range of situations such as research on the impact of climate change on cities.

Fieldwork in the face of instability requires a robust and flexible approach, to respond to unexpected change in the case study settings. The adopted interpretive and integrative methodology was able to effectively adapt to this dynamic context and provide a coherent body of evidence regarding the nature of urban comfort.

Some limitations of this methodology are also worth attention. Firstly, the nature of the case study sites and types of users at the time of the day when the fieldwork was carried out limited the possibility of interviewing business people or people that live and work in other areas of the city not covered in the case studies. Secondly, the early intention of covering all four seasons in the four sites was not possible due to the changing nature of the post-earthquake landscape.

4.3. Practical implications

The results of this study regarding adaptive capacity, types of urban settings, concepts of liveability and levels of urbanity, and the possibility of affording microclimate experience have practical implications.

The types of spaces identified in Christchurch have shown that there is a need to increase density but keep the peaceful atmosphere and retreat spaces. This challenges the idea of increasing businesses and economic value of streets through higher density living. There is a need to increase economic value and energy efficiency while still providing peaceful environments and retreat spaces. It is important to note here that the social character of public open spaces is largely influenced by design decisions.

It is in this point that understanding urbanity preferences plays a very important role. Urbanity is aimed at generating vibrancy and attracting people, but how much vibrancy is needed is culturally dependent. If Christchurch Central City is to attract people, and especially new residents, it has to respond to the local culture, values and lifestyle, and be able to provide the desired atmosphere. In Christchurch, this preferred atmosphere is translated into the Garden City way of living, and is more easily achieved with lower density. So a key design challenge is how urban design strategies should be adapted to the city's particular climatic patterns and culture to improve climate experience and adaptive capacity throughout the year, while delivering higher urban density.

Weather patterns cannot be changed, but the time locals stay in public open spaces could be increased as wind and sunlight can be significantly modified by design interventions (Brown, 2010, 2011; Brown & Gillespie, 1995; Sullivan, 2002; Walton et al., 2007). However meanings of weather and climate (W. B. Meyer, 2000; Shove, 2003; Strauss & Orlove, 2004a, 2004b) should also inform landscape design practices and use the potential of microclimatic design to enhance liveability in the city. There is a need to consider ways of influencing how people perceive microclimates, and design has to provide *interactive aesthetics* (Xenakis & Arnellos, 2013) that encourage people to recognise wider possibilities of being outside.

The second implication focuses on the social character of urban landscape resulting from design solutions, and the placement of these spaces in the city. This can be defined by urban policy, for example, by locating building uses that support social spaces in streets with poor microclimate.

The four settings investigated in this study provided insights regarding urban social spaces and urban retreat spaces and the types of users they attract – based upon age, lifestyle and activity. These users are attracted by different types and dynamics of urban environment, and some practical design strategies can also be outlined:

- **Spatial integration:** In urban social spaces the users like to 'see and be seen'. People are the main attraction to the places. Although the microclimate is not the key factor, it still has to be considered, especially during summer and winter, and if badly planned it can hinder the use of open spaces due to excessive wind or sun. The lesson here is that the appropriate microclimatic strategies must be weighed up with wider urban activity patterns, in a way that retains vibrancy.
- **Privacy:** In urban retreat spaces users look for a peaceful and comfortable setting and the place itself is the attraction. In these spaces the design needs are finely textured and focused on creating a 'great' thermal environment, even if it compromises some connections to street life.
- **Scale of intervention:** Strategies adopted both in urban retreat and urban social spaces need to be related to the scale of intervention. In urban retreat spaces the scale of intervention is more individual and easily amended with movable elements, providing a chance for interactive adaptation with wind screens, for example. In urban social spaces, the appropriate microclimatic strategies have to be expressed at a larger scale, designing with groups of buildings and their orientations.
- **Microclimate is a conceptual decision:** Some common strategies used to amend microclimate proved to be inefficient, demonstrating the need to consider microclimatic variables in the design concept phase. As an example, although umbrellas are useful regarding sun protection in seasons with higher sun, they are not the best solution for the windy summer in Christchurch.
- **Greenery:** Green elements can be used as design elements to improve microclimate and bring the restorative aspects of nature into the city. So when possible, green elements for shade and windbreaks should be used instead of built ones. In the case of Christchurch, green spaces – public and private – have a symbolic meaning and greenery is a desired feature of the Garden City way of living. While it is necessary to increase density, it is also crucial to keep and plan key green spaces, and to intensify the use of green elements in streets. These strategies can help reinforce the local identity.

Overall, users' urban comfort requirements should inform the choice for type of streetscape design – retreat or social – in varied areas of the city. The main outcome of providing the right environment for the type of user, and microclimatic solutions to ameliorate undesired variables is the provision of urban comfort and increase adaptive capacity.

This research has shown that there is a need to broaden the perspectives regularly adopted in urban microclimate design. If taken into account, in the short term urban comfort can provide extended use of public open spaces throughout the year and in the long term it can provide information for

understanding adaptation strategies that can inform future climate change action from a community-based perspective. By doing so, we can provide more liveable, comfortable and interesting places for specific communities, both now and into the future.

5. FURTHER RESEARCH

This research has contributed to the understanding of socio-cultural influences on the experience of weather and climate and the consequent adaptation. However, more research is necessary for the development of a larger body of knowledge regarding urban comfort and its application.

Geographically, New Zealand is one of the most remote countries in the world; this helps the country to keep a strong and unique culture. This study has pointed out differences between the local culture and interviewees who, despite living in Christchurch for several years, are originally from Europe, South America or Asia. This provided insights into the cultural differences and expectations regarding the urban environments, highlighting the need for more extensive research applied to other cultures and climates, particularly in more multicultural contexts. The nature of social and retreat spaces is related to the type of culture, and it would be interesting to explore how levels of integration and privacy are required in different cultures, the intensity of use of these spaces, and if they influence adaptation the same way they do in Christchurch. Locally, further research into the role of New Zealand's bicultural landscape on the local concept(s) of urban comfort is also needed. These perhaps diverse concepts of urban comfort – from the Maori and Pakeha's perspectives – should then inform the design of the built environment.

This study has also pointed out the need for further research on adaptation regarding climate change. Adger et al. (2009, p. 349) suggested that usually "adaptation to climate change is limited by the values, perceptions, processes and power structures within society [and w]hat may be a limit in one society may not be in another". The methodology applied in my research provided a means of deeper understanding how people relate to the climate, including possible cultural values that can be lost. The understanding of adaptation to the climate is of critical importance under the current scenario of climate change and should be investigated in other places, cities and countries.

Furthermore, I see very interesting opportunities for adopting the methodology I applied in this project in post-disaster research, especially considering the role of adaptation in places facing rapid changes. Urban comfort can also be valuable in fields such as well-being and health as it can provide important information for designing outdoor spaces that are pleasant for walking and where the concept of *cities for people* (Gehl, 2010) is enhanced; and in the field of tourism through a better understanding of how microclimate impacts the use of touristic areas and how tourists respond to urban comfort.

6. CONCLUSION

The main questions guiding this research considered meanings and characteristics of urban comfort in Christchurch, the role of culture on people's experience and adaptation to the local climate, the strategies adopted to achieve comfort, and the study of these interconnections through an integrative methodology.

In summary the findings highlight that the main characteristics of urban comfort in Christchurch are related to regional identity, the levels of urbanity and the strategies used to adapt to the local climate. Regional identity – expressed through the local outdoor culture – inspires the desired urban atmosphere, which should include greenery and opportunities for peaceful and personal space. These wishes are related to the Garden City way of living and require a lower level of urbanity. These findings were reflected in a variation of types of spaces, stressing that urban social spaces are important, but urban retreat spaces are equally significant.

Strategies used to adapt to the local climate happen both at the individual and at the collective levels. Individually, locals check the forecast and choose how to dress, and collectively (or socially) they choose the type of space to go to depending on their age, company and type of activity. The last important finding is that it is not possible to make sense of and plan for outdoor comfort in the city without understanding culture. All research findings have been discussed in this final chapter along with its implications for theory, methodology and practice related to urban landscape design.

The post-earthquake context in which Christchurch is currently inserted has emphasised the pressures that cities worldwide are facing. But while other cities might have the chance of gradually achieving sustainable density levels, Christchurch is at a turning point, where the decisions made in the next few years will determine a new urban morphology for decades to come. And although the United Nations Habitat III urban dialogue (United Nations, 2015) has pointed out the need for more compact and higher density cities, Christchurch has been rebuilding itself the way it knows best: based upon extensive and low density urban sprawl.

As this research has pointed out, Christchurch has long been a place proud of its peaceful atmosphere, and that is a part of its people's identity. When higher density is mentioned, locals associate the potential new urban environment with noise, pollution, and lack of privacy and green spaces. The question then becomes how to respond to the current pressures of urbanisation, while still responding to the local culture? Cities are not only about vibrancy, but they depend on vibrant places to be economically viable. How then can we generate more sustainable cities while providing a variety of types of spaces and levels of urbanity for the lifestyles and age groups that inhabit the city?

Climate change also adds another layer of challenges to urban environments, especially regarding how cultures will adapt to new scenarios, and values, symbols and meanings that can potentially be lost. In this research I provided evidence of some factors that constitute locally based urban comfort. The general theoretical approach can be applied to the field of adaptation to climate change, especially on studies focusing on the adaptive capacity of specific communities. There is a growing need to acknowledge that response to climate is place-based and culturally constructed, and that understanding these dimensions of climate adaptation can contribute to the design of more resilient and sustainable cities.

As noted by Strauss and Orlove (2004a, p. 6):

> Our different cultures shape the way that we think and respond to the weather; as we face the impacts that climate change processes bring to our communities, we must recognize that our perceptions as well as our reactions are shaped by our culture.

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APPENDIX 1: ETHICS APPROVAL

Lincoln University
Te Whare Wānaka o Aoraki
CHRISTCHURCH•NEW ZEALAND
New Zealand's specialist land-based university

Research and Commercialisation Office

T 64 3 325 3838
F 64 3 325 3630
PO Box 84, Lincoln University
Lincoln 7647, Christchurch
New Zealand

www.lincoln.ac.nz

Application No: 2011-27 12 October 2011

Title: Bioclimatic Landscape Design – Improving outdoor comfort in Christchurch towards a more liveable city

Applicant: Silvia Garcia Tavares

The Lincoln University Human Ethics Committee has reviewed the above noted application.

Thank you for your detailed response to the questions which were forwarded to you on the Committee's behalf.

I am satisfied on the Committee's behalf that the issues of concern have been satisfactorily addressed.

I am pleased to give final approval to your project. Please advise Julie Ward when you have completed your research and confirming that you have complied with the terms of the ethical approval.

May I, on behalf of the Committee, wish you success in your research.

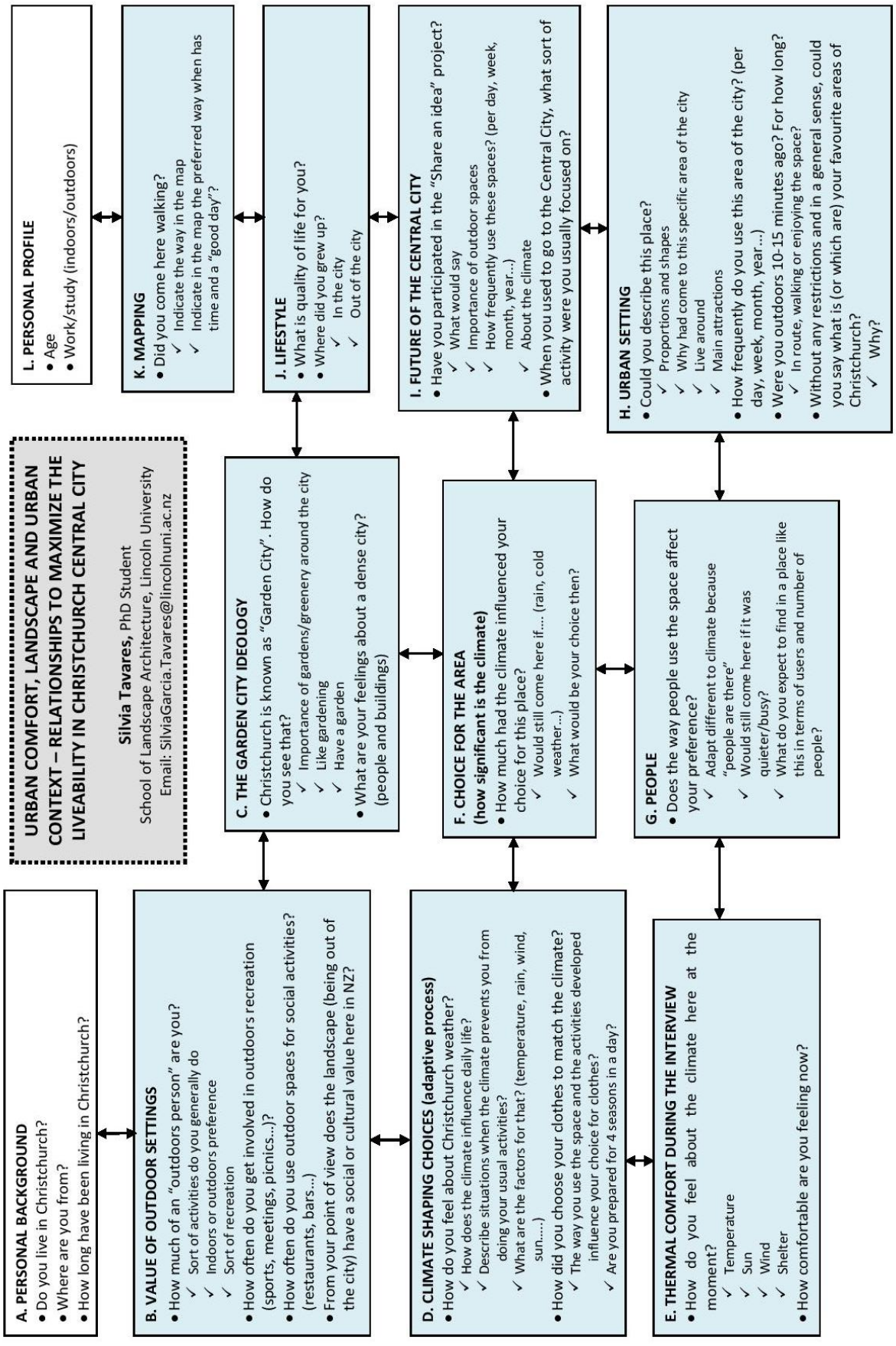
Yours sincerely

Professor Grant Cushman
Chair, Human Ethics Committee

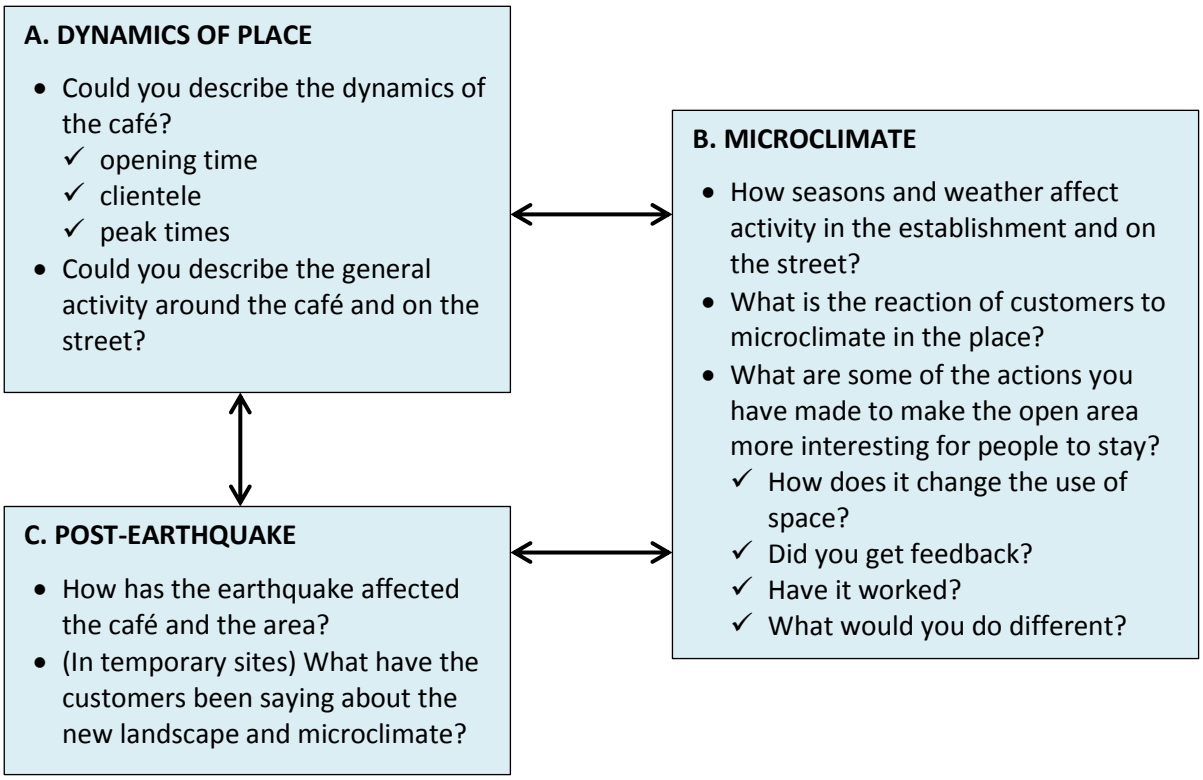
Cc: S Swaffield, E Stewart

PLEASE NOTE: The Human Ethics Committee has an audit process in place for applications. Please see 7.3 of the Human Ethics Committee Operating Procedures (ACHE) in the Lincoln University Policies and Procedures Manual for more information.

APPENDIX 2: INTERVIEW GUIDE – GENERAL PUBLIC



APPENDIX 3: INTERVIEW GUIDE – KEY INFORMANTS



APPENDIX 4: INFORMATION SHEET

Lincoln University Policies and Procedures

Lincoln University
Faculty of Environment Society and Design – School of Landscape Architecture

Research Information Sheet

You are invited to participate as a subject in the project **"Bioclimatic Landscape Design – Improving outdoor comfort in Christchurch towards a more liveable city"**

Aim of this project

The project aims to produce recommendations for landscape design to enhance liveability in Christchurch's Central City post-earthquakes. I am interested in "Bioclimatic Landscape Design" which is landscape design adapted to local climate. I would like to explore how local people adapt their routine and activities to suit the climate. The results of the research will help to improve our understanding of urban areas, and how we can best plan for liveable open spaces and a sustainable urban environment.

Your participation in this project

Your participation in this project is based on an interview that will take 15-20 minutes, while environmental data (temperature, radiation from the sun and surfaces, wind and humidity) is collected. The interview aims to identify climatic conditions and characteristics of the city that produce outdoor comfort for Christchurch's long term residents. Your participation in this project is voluntary and no foreseen risks are involved. Moreover, if for any reason you decide to withdraw from the project, including withdrawal of any information you have provided before, you should do that within one month of the interview date. The interview may be digitally recorded and the transcripts will be available for revision within 3 weeks after the interview. Then, if you would like to review this document, please contact me in the email/phone provided in the end of this information sheet within a week of the interview.

The research topic requires the interviewees to be over 16 years old and be long term resident's in Greater Christchurch. Potential participants living in Greater Christchurch for less than 5 years or under 16 years old may be excluded.

The results of the project may be published, but you will be assured of your anonymity in this investigation. The identity of any participant will not be made public, or made known to any person other than the researcher, her supervisors and the Human Ethics Committee, without the participant's consent. To ensure anonymity the following steps will be taken:

a) The consent forms and data will be stored in the researcher's personal computer, at home, with password to access personal files. The consent forms and interview transcripts will be stored at locked and separated compartment, until the project completion.
b) After 6 years the consent form and data will be destroyed, as recommended by Lincoln University Human Ethics Committee. The data will be deleted and consent forms will be shredded.
c) The confidentiality of the consent forms and all information that may identify participants and the anonymity of data will be assured by attibuting codes for interview transcript files and pseudonym in published work. These files will be stored separately from a list linking the name of interviewees to their codes and pseudonym.

I am undertaking this research as part of my studies towards a PhD on Landscape Architecture. My supervisors and I will address any questions you might have regarding this research. Our contact details are as follows:

The project is being carried out by:

Silvia Tavares, Arch. MSc. (SilviaGarcia.Tavares@lincolnuni.ac.nz) – Faculty of Environment, Society and Design – School of Landscape Architecture – Lincoln University – Christchurch, New Zealand
Ph: +64 3 3253838 Ext.: 8970

Supervisors:

Professor Simon Swaffield (Simon.Swaffield@lincoln.ac.nz) – Faculty of Environment, Society & Design – School of Landscape Architecture – Lincoln University – Christchurch, New Zealand
Ph: +64 3 325 2811 Ext: 8442

Dr. Emma Stewart (Emma.Stewart@lincoln.ac.nz) – Senior Lecturer in Parks & Tourism – Faculty of Environment, Society & Design – Lincoln University – Christchurch, New Zealand
Ph: +64 3 325 3838 Ext: 8926

The researcher will be pleased to discuss any concerns you have about participation in the project.
The project has been reviewed and approved by the Lincoln University Human Ethics Committee.

20 February, 2012

APPENDIX 5: CONSENT FORM

Lincoln University Policies and Procedures

Consent Form

Name of project: ***Bioclimatic Landscape Design – Improving outdoor comfort in Christchurch towards a more liveable city***

I have read and understood the description of the above-named project. I understand that if for any reason I decide to withdraw from the project, including withdrawal of any information I have provided, I should do that within one month of the interview date. I also understand that the transcripts will be available for revision three weeks after the interview, and I may contact the interviewer by email/phone provided in the information sheet, within a week of the interview date, if I want to review the interview transcript.

On this basis I give consent for interview to be recorded by (__) a digital recorder or (__) manual note (please tick one). I also consent to the publication of the project results with the understanding that anonymity will be preserved.

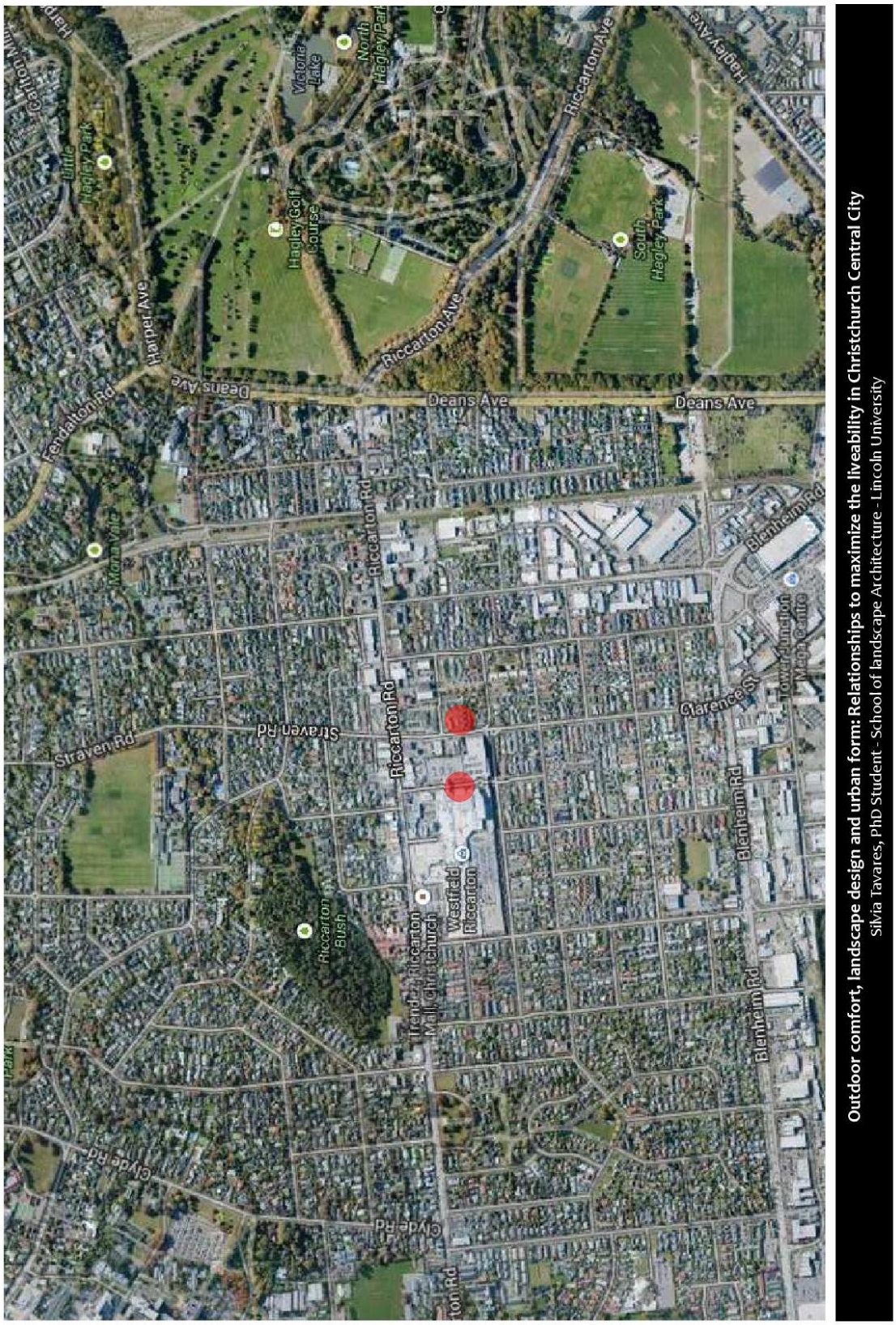
Name: _____

Signed: _____ Date: _____

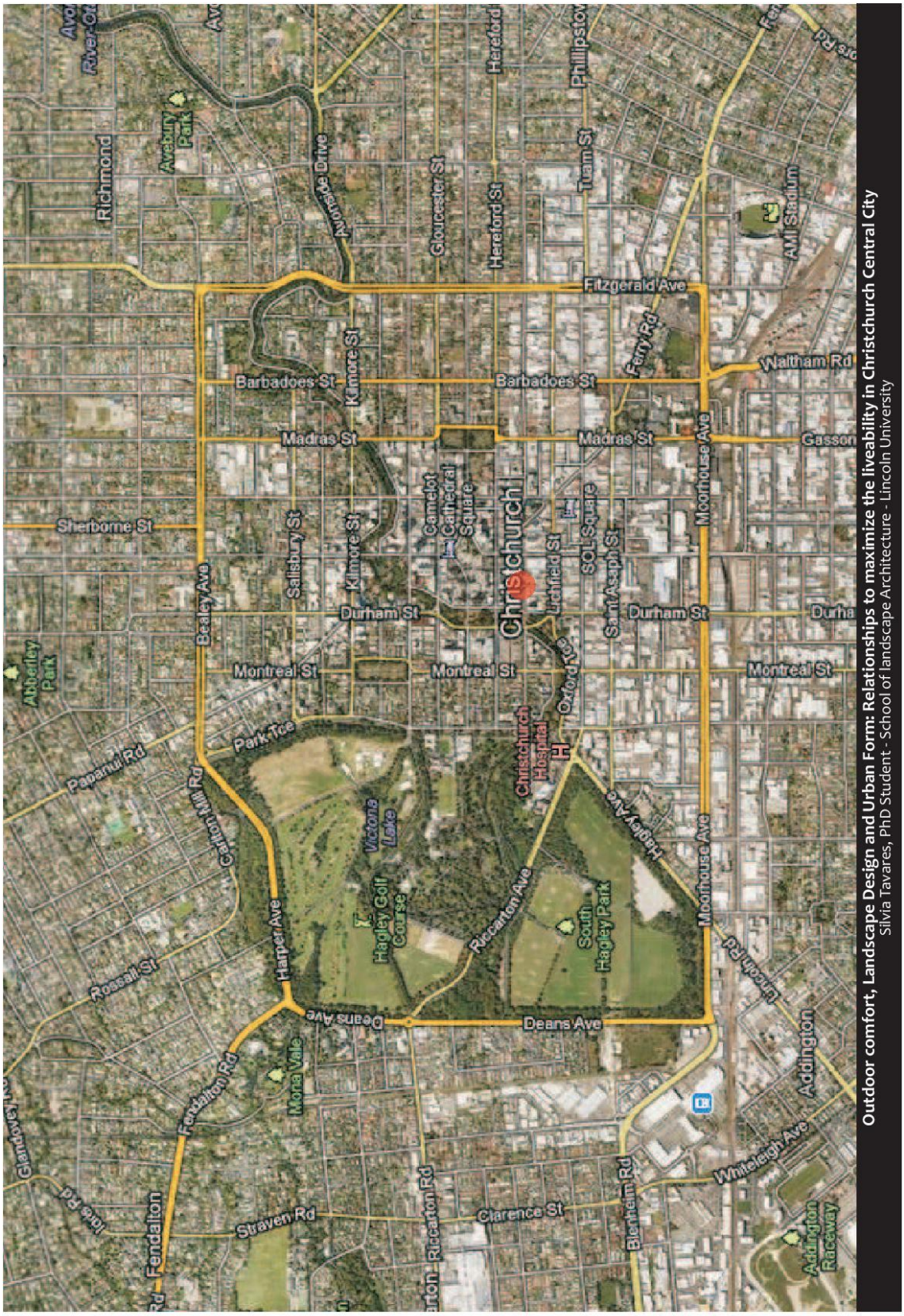
20 February, 2012

APPENDIX 6: MAPS PRESENTED TO INTERVIEWEES

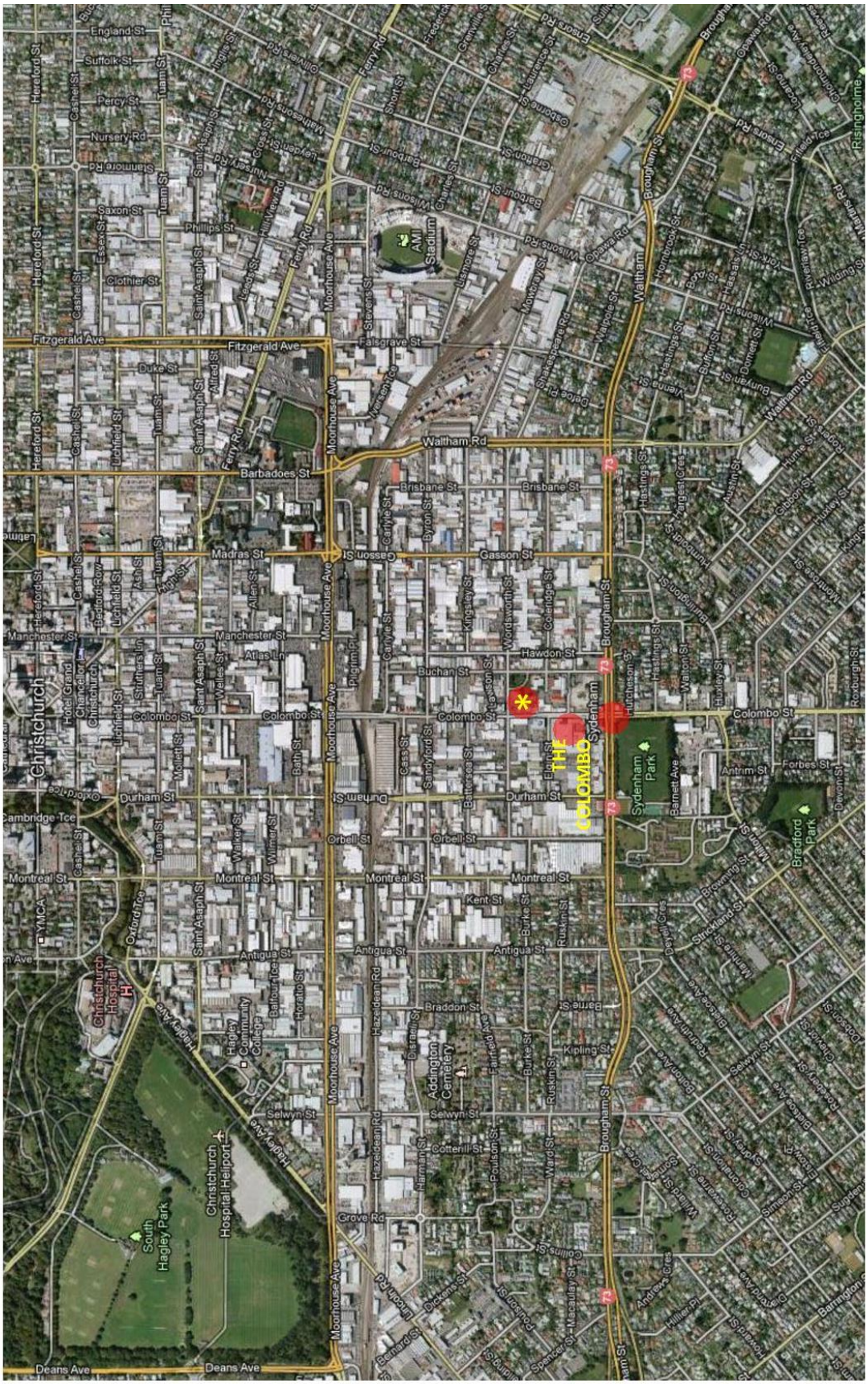
6.1. Riccarton



6.2. Central City



6.3. Sydenham



Outdoor comfort, landscape design and urban form: Relationships to maximize the liveability in Christchurch Central City
Silvia Tavares, PhD Student - School of landscape Architecture - Lincoln University

APPENDIX 7: POST INTERVIEW FIELD NOTES

Post-interview field notes

Code:
Date:
Time/time of interview:
Place:

- Clothing and accessories (upper and lower body + jackets)

- Activity (walking, sitting, exercising)

- Position (sun/shadow)

- Age

Further notes: